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MECHANICAL ENGINEERING DEPARTMENT

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Electric Railway Journal

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THE MICROSCOPIC EYE

The final efficiency of an assembled power plant is a function of many variables which it is important to control as closely as possible in the actual installation and handling of the equipment. The microscopic eye must be cultivated in making inspections if many elusive sources of loss are to be discovered. Operating economy is in the last analysis a perpetual chase after recalcitrant heat units. The following points noted in a recent inspection illustrate the importance of going over the plant on the fine-toothed-comb principle, and while they present little that is novel, they indicate losses which cost just as much money in a month's run as though warnings had never before been sounded in regard to their occurrence. In the plant in question a number of flanges on the high-pressure piping for water and steam service were found to be bare inside and outside of the station; the high-pressure auxiliary steam lines were insufficiently covered, and drips from the steam main to a return trap behind the boilers were left uncovered. The installation of asbestos covering at once cut down these sources of inefficiency. Other improvements carried into effect as the result of the same examination of the plant were the biweekly cleaning of the ash conveyor to avoid fires, the covering of the outside of the coal conveyor with a gallery to keep the moving parts dry, the painting of ironwork in the station basement, painting of flanges and waterproofing of pipe covering. Cleaning of an open feed-water heater was also inaugurated on a three months' basis.

THE CENSUS OF ELECTRIC RAILWAYS

That the United States Census Bureau is to make another census of electric railways is a matter upon which the industry can well congratulate itself. Owing to the expenditure of time and money by the government upon this work and the agreement which has been made on the part of the Census Bureau in the past to keep the reports of individual companies secret, the resulting compilation of totals and averages has been as nearly perfect as could reasonably be expected. No one who has not tried to compile statistics of the results of operation and capitalization of the electric railways of the country at a given time can realize how difficult a task is involved, first, in the accumulation of the necessary data, and, second, in the analysis and the totaling of the figures and proper allowance for the factors that should be taken into account if the results are to be fairly reliable. A number of questions arise in the work which do not exist in the same degree in, for instance, the preparation of similar data for the steam carriers of the country. Among these questions we may mention the lack of uniformity in the accounting systems of the companies and hence the difficulty of collection of uniform reports compiled by like methods; the intercorporate ownership relations existing in consolidated properties, with the resulting duplication of outstanding capitalization and the necessity of allowances for that part of the securities which is based on stock and bonds not in the hands of the public,

but owned and held by the controlling company and thus directly represented by its own outstanding capitalization, and, lastly, the very common combined ownership of railway with electric lighting or other facilities and the desirable segregation in such cases of capitalization, earnings, expenses, balance sheet, statistical returns, etc. We mention these matters, not to magnify the amount of labor that will be devoted to the 1912 census, but to direct the attention of the companies to the importance of the results to the industry as a whole and to the wisdom of willing and prompt co-operation with the authorities in order that the returns may be as nearly complete as possible. The value of a compilation of such figures can hardly be overestimated, not only to those engaged actively in the industry but also to those who are interested either through the medium of investments or through the relations of business.

THE STANDARD SYSTEM OF ACCOUNTS

The report of the committee on a standard classification of accounts, presented before the American Electric Railway Accountants' Association during the Chicago convention, indicates that work of much importance is to be taken up. It states that the committee expects to be called upon shortly to discuss with the Interstate Commerce Commission the question of a classification of expenditures for additions and betterments, a form of general balance sheet, a classification of revenues and expenses of auxiliary operations and a statement of income and profit and loss account. It also appears likely that there may be a revision of the text of the classifications now in use. It is the plan of the commission to establish the same completeness of forms of report for electric carriers that it has for other carriers. The national organization of accounting officers in each form of carrier interested has co-operated with the commission in this work. With the carriers actually engaged in interstate commerce the system of accounts prescribed by the commission becomes mandatory. With the electric carriers, however, so small a number in proportion to the total in the country is engaged in interstate business that, in the interest of uniformity of accounts, the co-operation of the accounting officials is especially desirable. Without co-operation there will not be a widespread adoption of any uniform system of accounts for electric carriers. In fact, the present standard classification is not in general use throughout the country; many companies are still using the old standard classification or an adaptation of it. One of the largest companies in the country changed only recently from a modified form of the old standard classification to the classification now recommended by the association as standard. Conformity with a new system of accounts is not possible by some companies which are not engaged in interstate business unless the state authority to which they report directs a change. The requirements in different states vary now and tend to increase still further the diversity of accounting methods. If the proposed new classifications and forms of report are considered with great thoroughness and care, as undoubtedly will be the case on the part of both the committee and the commission, the result should be a standard toward which the companies can air for some years, and, eventually, practical uniformity of accounts everywhere.

THE VALUE OF DISCIPLINE

One of the most striking exhibits produced at the recent convention was the study of accidents presented by the committee of the Claim Agents' Association on the training of employees. Although the data were obtained chiefly from one organization, that one was so big and so typical that the facts are of general applicability. The chief point of the matter is that experience seems to have shown beyond a trace of doubt that accidents in tramway transportation are chiefly due to the inexperienced man. In looking over the charts showing the relation between responsibility for accidents and years of service one must, of course, take other things into account than the mere face of the figures. It is very safe to assume, for example, that the extraordinary immunity from accidents of employees who had seen twenty to forty years of service was in no small part due to the fact that there is a comparatively small proportion of such veterans in any service and of that small proportion a considerable number are in departments of service which tend to lessen their liability to produce accidents.

Very much more striking, therefore, is the presentation of facts regarding the valuable result of even a few months of experience. If anything could possibly enforce the importance of rigorous discipline in the service of a tramway company, it is figures such as these. Most companies can and do give new employees careful instruction in their duties and can compress a large amount of useful experience into a comparatively short period of instruction. The real exigencies of his work, however, the employee has to learn for himself, and on those qualities of steadiness, alertness and resourcefulness which cannot always be fully evaluated at first the future usefulness of the man must depend.

To obtain a body of thoroughly reliable men requires not only great care in selection and preliminary training but also sharp discipline kept up for a considerable period of service. In other words, those in a railway company who are responsible in the last resort for the safe carriage of passengers must have full authority to sift out men who prove inefficient without hindrance on the part of anybody. No railway company can do its duty to the public without the maintenance of discipline, and the public ought to recognize this necessity by standing by a company in every exigency where discipline is at stake. We have the fullest respect for the rights of the workingman, but we do not consider that these rights extend in the slightest degree to the subversion of necessary discipline.

Interference with the maintenance of discipline, under whatsoever guise the attempt is made, reacts directly upon the safety of the public. Even so good a thing as civil service at times tends to injure efficiency by making it extremely difficult to get rid of a man who is merely hopelessly mediocre and unsuitable for his position. In private business it is just this class of man that has to be displaced for the general benefit of the service. Wherever it is possible to sift out employees with a free hand these slightly incompetent and moderately shiftless men are promptly put off the pay roll. In the street railway business, during the several years of training required to make a first-class experienced man, just this process of

selection should go on and does go on in companies which really are at liberty to run their own business. The general public should see to it that in this particular at least every company does run its own business.

QUESTIONS OF POWER DISTRIBUTION

The extent of the information presented in reports of committees at the Chicago convention was so great that it will take some weeks to read it carefully, to say nothing of digesting it all. For this reason we feel that we shall be pardoned if we comment at this time upon some of the interesting points brought out in the admirable report of the committee on power distribution. The fact that its conclusions also affect the practice to be followed by other owners of overhead wires than the electric railway companies makes the decisions reached of more than usual interest.

It would be difficult to speak too highly of the care and thoroughness which this committee has put into its report. It is a compendium of sound current practice in the installation of high-tension lines and can be studied with profit by every engineer who has this kind of work to do. From so valuable a mass of material it is no easy matter to pick out specific items particularly worthy of comment. But it seems to us that the word of the committee on some moot points should receive special emphasis. One of these is the matter of crossings with railways and overhead lines of various sorts, a subject which has been continually to the front in electric power distribution and has been the cause of some exasperating misunderstandings.

With respect to the railroad crossing, it seems to us the opinion of the committee, that the inherent dangers are to be minimized by simplifying and strengthening the structure rather than by complicating it, is thoroughly sound and that this judgment should be unanimously followed. If the overhead conductors are properly designed, placed and supported, they give all the security against accident that can be desired. It is far better to increase the factors of safety and to put extreme care into simple construction than to indulge one's self in a variety of alleged guarding devices having in themselves a lower factor of safety than the thing which they are intended to guard. Every complication of overhead wiring brings its penalties in the danger of disarrangement, and in addition increases the cost and difficulty of construction out of all proportion to any possible good that can result. If it is desirable, let us say, to go to an extra expense of $100 to secure a crossing, that sum is far better put into factor of safety than into additional guards of equal expense and with a smaller factor of safety.

The same considerations hold also for the specifications given for overhead crossings with foreign wires. Where a crossing has to be made, the crossing span should be so securely built and the conductors so carefully installed as to avoid danger of failure in so far as, humanly speaking, it is possible to avoid it. The general rule recommended of keeping the higher voltages above the lower voltages, and in particular above telegraph, telephone and signal wires, is a thoroughly sound one, since if experience with electrical distribution proves anything it shows unmistakably that these small low-tension wires are the first to go in case of trouble. Time and again one will travel across country after a sleet storm and see all the light smaller distributing wires of whatever kind down in a hopeless tangle and the power transmission circuits still standing out intact. It is the business of the company that installs high-tension wires to make them secure at crossings by the most thorough and careful methods of installation. And the position suggested by the committee is one that tends to the greatest security. Bearing this in mind, one may consider the relation of such requirements to the factors of safety suggested by the committee.

The minimum factor of safety permissible on wires, cables and pins is given as two, based on ultimate stress. At crossings and other danger points this might profitably be raised to three or even more, according to the necessities of the situation. And, in general, factors of safety sufficient for straightaway work should in all practical situations be increased. With this proviso the table of the factors of safety is a thoroughly conservative one.

Exceedingly well worth study are the paragraphs on electrical factors of safety in insulators. Roughly the policy recommended by the committee is to use the factor of safety of at least three dry and two wet, these figures being raised to the neighborhood of four and three respectively in the lower voltages where higher factors of safety are very easily obtained. Such insulators well tested should give a degree of security against breakdowns entirely adequate in all ordinary cases. Now and then from extraordinary climatic conditions it may be desirable to raise the wet flash-over test so as to show a factor of safety of two and one-half or three even at high voltages. Such conditions, however, are not common. The committee recognizes the insistence of unusual conditions in providing a factor of safety of four wet for strain insulators.

At only one point are we inclined to differ from the committee report in the matter of insulators, and that is in the specification that insulators for voltages exceeding 5000 shall be porcelain. First-class glass insulators have certainly given an extremely good account of themselves for a good many years past at voltages much exceeding this limit. They can be made to have fully adequate factors of safety for voltages certainly up to 10,000 or 15,000 when properly designed and constructed, and have in very many instances in use on a large scale proved entirely satisfactory. In the choice of insulators there is a wide opportunity for variation in individual opinion, but we should not hesitate to range ourselves on the side of the glass insulator as entirely adequate for the lesser transmission voltages now in use, unless it is in rare instances where the mechanical strain of heavy conductors on long spans may induce particular risk of breakage. The long list of wire tables with which the report closes is decidedly the most complete and satisfactory that has yet been published, furnishing all the necessary information regarding weight, conductivity, etc., of the different sizes of wires in extremely convenient form for reference. These have, however, been prepared as working tables and from them have been eliminated data not ordinarily required but which can be obtained when desired from reference books.

Hartford Trackwork of the Connecticut Company

A Description of Track Standards and Construction Methods Used on the Hartford Division of This Company

The organization which is responsible for the construction and maintenance of the trackwork of the Connecticut Company in and about Hartford is under the supervision of the roadmaster of the Hartford division. The total amount of track cared for from this center now amounts to 180.508 miles as distributed through Hartford and the adjoining towns of West Hartford, East Hartford, Weathersfield, Windsor, South Windsor, Glastonbury, Newington, Rockville, Manchester, Farmington, Unionville, Stafford Springs, Rocky Hill, Bloomfield, Elmwood and Rainbow.

ORGANIZATION

The minimum number of men in this organization is about ninety, but the maximum of 450 men has been reached during heavy periods. Practically all the construction work is done by forming new gangs under the foremanship of the best men from the regular maintenance organization. Very little work is done on a contract basis. The roadmaster's staff is divided into three sections, the office force, consisting of the engineer and inspector and of the office clerk, timekeeper and stenographer; general employees, consisting of a bonding gang, switch repair man, material man and work train crews; and employees working on established sections, consisting of various division foremen, city foremen and the track greasers. The work is laid out as follows:

The engineer and inspector stakes out the work, gives lines and grades, makes small surveys for the claim department, acts as general inspector on bridge paving and contract work, files all plans, acts as draftsman and when necessary also serves as foreman.

The office clerk, timekeeper and stenographer checks all pay-rolls, bills and accounts, makes up all pay-roll distributions, keeps all office records, makes all reports, checks all requisitions made on the storekeeper for material and tools and keeps all costs data.

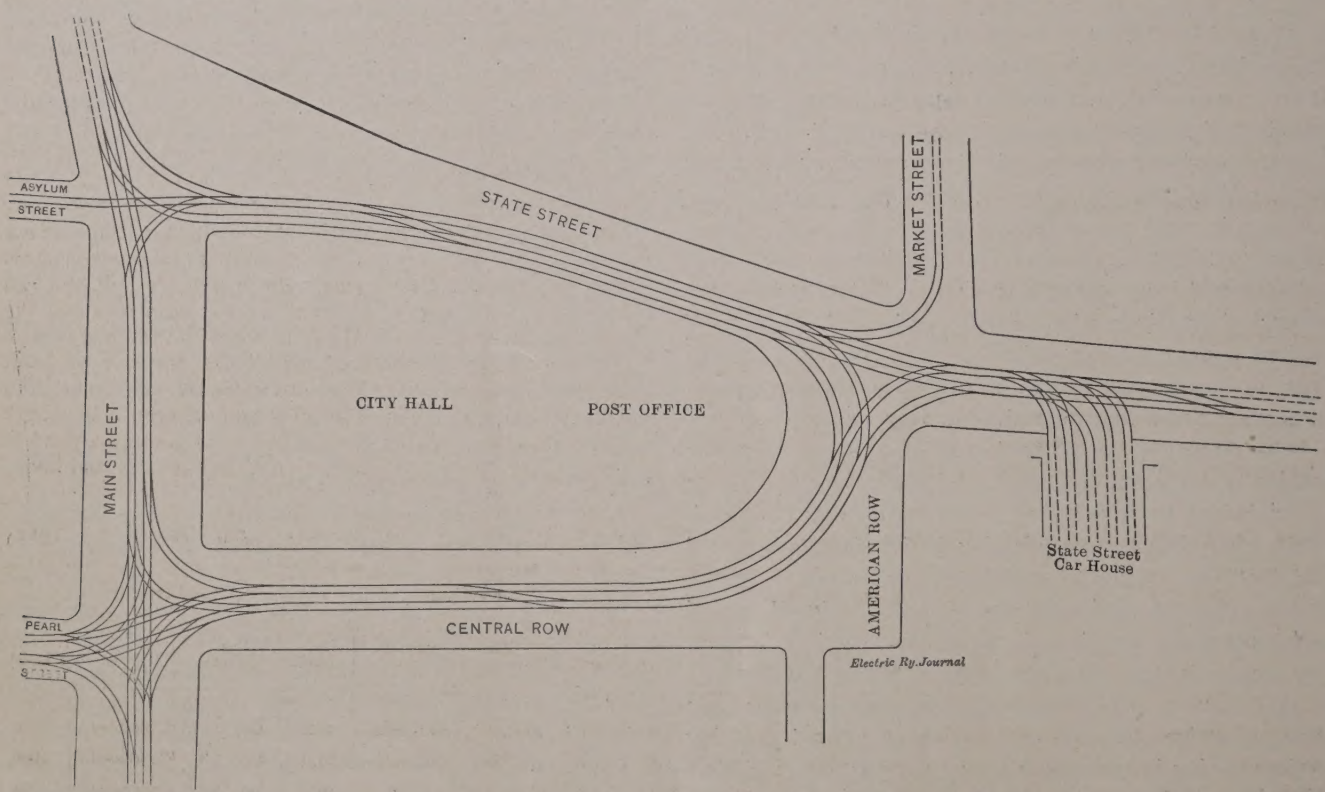
The bonding gang bonds all important work, including the electrified steam lines, handles small construction or maintenance jobs and, where necessary, acts as a regular gang on any work.

The switch repairman, who is known locally as the switch physician, repairs switches and other switching devices, resets hard centers in all special work, sets and cleans track drains, makes small changes and repairs around special work, does some joint welding repair work and with his one or two helpers can also be used to form an emergency crew.

The material man supplies all gangs with tools and material, checks all material when received and shipped, makes all requisitions on the storekeeper, moves gangs and tools from place to place, welds broken joints and grinds joints and special work. He is assisted by a blacksmith and apprentice, and a motorman and helper.

The crews in charge of work trains haul all material used by the track department and also such heavy material as is required by other departments, haul all waste material from the streets to a dump, haul snow and ice from streets, run salt and sand cars when necessary, haul coal and sand to carhouses and haul ties and timber for use at different points.

The division foreman of the Elmwood, New Britain and Rocky Hill lines has charge of all track and roadway repairs on these lines and assists on construction work in Hartford when possible. He has twelve trackmen in summer and four in winter.



Hartford Way Department—Plan Showing Special Work Layout at City Hall Loop and State Street Carhouse

The division foreman of the Farmington and Unionville line has charge of all track changes or repairs and handles small construction jobs on this section, including bridges and culverts. He has twelve men in summer and four in winter.

The division foremen of the Bloomfield-Elizabeth Park lines and of the Rainbow line have duties similar to those of the foremen just mentioned. The Bloomfield foreman, however, has eight men in summer and three in winter, while the Rainbow foreman has twelve men in summer and four in winter.

There are two Hartford foremen of construction work and one division foreman for work in Hartford. One of these construction foremen handles large construction jobs, including special-work layouts, street changes, etc., with the assistance of other sub-foremen, division foremen and gangs, including the bonding gangs. In the winter he is in charge of most of the street cleaning, such as snow and ice removal. The other Hartford construction foreman handles all summer construction work about the city, his men being also used as a general gang on all sorts of work which require special attention. During winter a section of the Hartford streets is cleaned by this gang. The division foreman of city (Hartford) work handles all repairs within the city limits which are not covered by the larger gangs. He makes many special-work repairs, and with his men is ready to act as an emergency gang at all times. During winter this gang hauls coal, snow, ashes, ties, etc., helps to clean the streets and otherwise assists the division foreman if necessary.

THE CONNECTICUT COMPANY.
HARTFORD LINES

Track Grades for _____
From _____ to _____
Spikes driven on _____ side of street
_____ feet from _____ gage line
# Indicates change in grade

Station	Cut	Fill	Reference

Electric Ry Journal

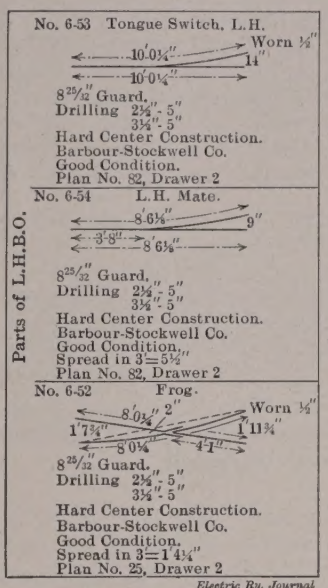
Hartford Way Department—Instruction Form for Track Foreman

The division foreman of the East Hartford lines has charge of all repairs on the same and does much construction work on suburban layouts. He has thirty men in summer and eight in winter.

The division foreman of the South Manchester lines looks after all maintenance work and does some construction. He has twenty men in summer and eight during the winter.

The duties of the division foreman of the Rockville & Stafford Springs line are similar to those of the East Hartford and South Manchester foremen. He has twelve men in summer and three in winter.

The track greasers clean and grease curves and switches, open all track drains, inspect all locations and conditions which need attention, report all defects in track or roadway and clean, oil and inspect all switching devices. The three greasers in Hartford report to the office every night. In addition, one greaser each is stationed at Rockville, Unionville and South Manchester.



Electric Ry. Journal

Hartford Way Department—Record of Special Work

TRACK DEPARTMENT RECORDS

The track department records in Hartford are few in number but are of such a character that a most thorough check is kept on every part of the system. The fundamental record, which is kept in a 7-in. x 11-in. blueprint book, shows, according to line, the detail construction and equipment of every foot of track and pavement in a given street. As shown in the accompanying reproduction, this track statement names the line, gives the streets between which the tracks are laid, the rail sections for the out or in track as the case may be, the length of the rail section, the date when the track was laid, the number and diameter of drill holes, the size of joint plates, the center to center distances of the track, the character and date of the pavement and the type, size, length and date of the bonding. Similar blueprint books are used to index special work and maps, as well as sketches and bond-

THE CONNECTICUT COMPANY—HARTFORD LINES TRACK STATEMENT WETHERSFIELD LINE 1912

STREET		RAIL SECTION					T'K.	PAVEMENT		BONDING			
From	To	In Track	Length	Date Laid	Drillings	Plate	C. to C.	Character	Foundation	Date Laid	Size, Length	Type	Placed
So. Green Junction		P.S.Co.273.	50'	1910	5"5"5"5"5" 5"5"7"5"5"	32"	10'	Asphalt..	Concrete..	1910	4-0 1-10" 1-12"	Concealed..	1910
So. Green	Wyllys St.	P.S.Co.273.	50'	1908	5"5"5"5"5" 5"5"7"5"5"	32"	10'	Asphalt..	Concrete..	1908	4-0 1-10" 1-12"	Concealed..	1908
Wyllys St.	Benton St.	P.S.Co.273.	50'	1908	5"5"5"5"5" 5"5"7"5"5"	32"	10'	Macadam.	Telford...	1908	4-0 1-10" 1-12"	Concealed..	1908
Benton St.	Elliott St.	L.S.Co.229.	30'	1891	5"5"5" 5"7"5"	22"	9'2"	Macadam.	Clay.....	1891	4-0 2-32"	Cable.....	1906
Elliott St.	Victoria Road.	Beth 37...	30'	1896	.....	....	9'2"	Macadam.	Clay.....	1896	Electric weld		1909

Hartford Way Department—Fundamental Record of Track

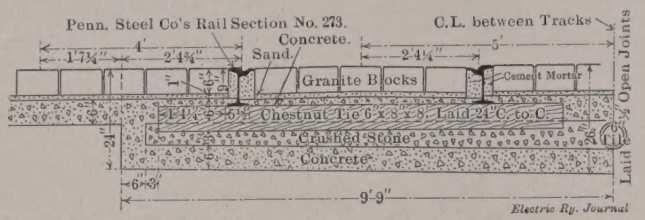
Another interesting record is a 4-in. x 6¾-in. blueprint booklet which lists all second-hand and other valuable special work pieces on different pages in the manner reproduced. It will be observed that the description gives the name, dimensioned sketch, construction, type, maker, diameter of drillings, height of guard rail, place and amount of wear, general condition of serviceability and a reference

ing layouts. The various steel rail makers are furnished with a set of all plans which would be of interest to them so that mere mention of the identifying location number is enough to guide the manufacturer as to the character of the work referred to in the railway company's order. The form as used also has a column for the section of rail used in the "out track," but that column is omitted in the reproduction of the form above because there is no out track on the Wethersfield line.

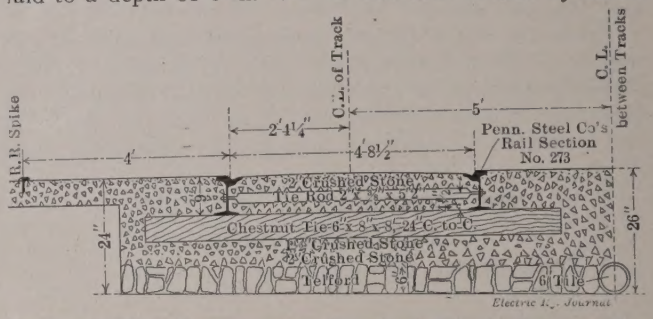
to the number and location of the original detail drawing. This record, therefore, forms a ready guide which enables a man to see what is available in the way of special work without spending a lot of time and hard labor in the track storage yard. The record books are brought up to date every first of January.

NEW AND REBUILT TRACK

During the past year the Connecticut Company has done a large amount of rebuilding and new construction of track on its Hartford lines. Much double-tracking has been required because of the rapid growth of the city. The rehabilitation included the removal of corrugations, especially on sections laid on longitudinal concrete beams, and



Hartford Way Department—Standard Track Construction for Granite Block Pavement

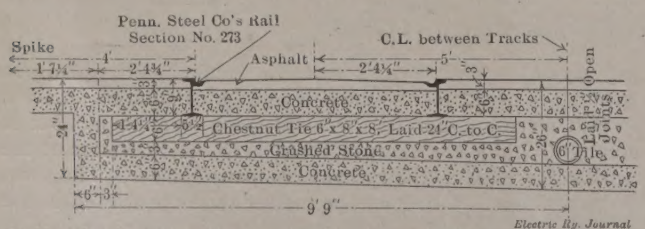


Hartford Way Department—Standard Track Construction for Macadam Pavement

the electric welding of about 3000 joints to lengthen the life of the old track. A Nichols-Gherky grinder was used for three months in the summer of 1911 and will be used this year probably for an equal period. Thermit was used for repairing broken electric welds. By the end of May, 1912, about 1200 electric joints for rehabilitation work had been completed. Compromise thermit welds are kept in stock for junctions of new and old work on all relaying jobs. The compromise piece is moved ahead on the rail as new sections are installed. About a dozen electric switches are now in use, and twenty similar switches will be installed at an early date.

The principal reconstruction during the year, aside from minor jobs, consisted of 5½ miles of single track on different streets. The principal new construction comprised about 4½ miles of double track. In addition to this work in the city, the Glastonbury interurban line was relaid for approximately 4 miles, and a freight spur extension about 1 mile long was built to a factory. The principal special work jobs were a twelve-track Lorain layout in front of the South Manchester carhouse and some Manard special work on Farmington Avenue.

The new and replacing construction used in the city consists of Pennsylvania Steel Company's No. 273 or 273a girder rail (125-lb. or 133-lb.), laid in 50-ft. lengths on untreated chestnut or white oak ties, spaced 2-ft. centers, except at joints, where the spacing is 18 in.; tie rods approximately 6 ft. 4 in.; Continuous or Pennsylvania splice-bar joints. Most of the city track is in asphalt, but there



Hartford Way Department—Asphalt-Paved Track Construction

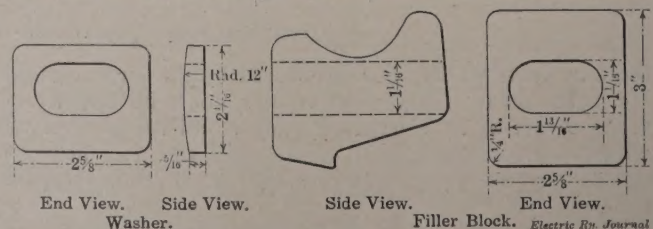
is also a little in granite block. The displaced city track averaged 85-lb. tram rail per yard. The new interurban construction, which replaced 45-lb. or 70-lb. rail, consists of 80-lb. T-rail made in 60-ft. lengths and placed on ties laid 2-ft. centers in rock ballast with a sub-drained foundation. During 1912 the company expected to install about 9 miles to 10 miles of single track, mostly in macadam, three double-track branch-offs, two cross-overs, etc. Part of this work will be new construction and part the replacement of 48-lb. and 60-lb. T-rail by 80-lb. T-rail.

TYPES OF TRACK CONSTRUCTION

The company uses three types of track construction, according to whether the pavement is macadam, granite block or asphalt, as shown in the accompanying drawings. Where a macadam pavement is used the substructure consists of a base composed of Telford stone and about 6 in. square, laid to a depth of 6 in. to 8 in. and then bedded by means of a steam roller. The next step is to cover this foundation with 1½-in. to 2-in. crushed trap rock to a depth of 4 in. or more below the ties and to 9 in. above the ties. Stones of 2-in. size are large enough to prevent their being torn out of the roadway by automobiles. After the track is surfaced and tamped, a top layer of broken stone is added, the voids being filled with sand. The top is bound by a dressing of screenings because without sand the roadbed would tend to shift. The ties are of 6-in. x 8-in. x 8-ft. chestnut, laid 2-ft. centers, and the rail is the Pennsylvania Steel Company's section No. 273 or equivalent. The tie rods are 2 in. x ⅜ in. x 5 ft. 2 in. and are secured approximately at the middle of the web. The tie-rod and rail practice is the same for all classes of construction.

The construction for granite block pavement consists of a foundation of 6-in. concrete, at least 3 in. to 5 in. crushed stone beneath the ties and enough concrete over the ties to carry a 1-in. sand cushion for the paving. The rails are embedded in cement mortar as shown. The asphalt construction is similar to the granite block pavement for the foundation, but there is 6 in. of concrete above the ties to carry the asphalt.

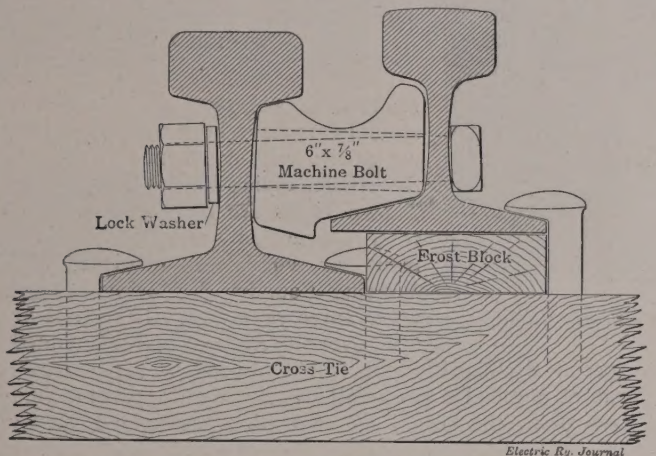
It will be noted from the three foregoing cross-sections that all work is laid on a 4-ft. offset as indicated by spikes which have been set in accordance with the established grades of the city. Each spike is numbered and the corresponding line and grade at its location are given to the track foreman on a reference sheet of the type reproduced. Thus the foreman can get either his line or grade from any spike. He is merely informed that he must make a cut or fill of so many inches from the top of the spike to the top of the rail. The foreman obtains his line or grade by means of a No. 2 Verona adjustable level which has a range of 8 in. A gage at one end of this level is screwed tight for any desired height. The level is placed on the spike for a cut and on the rail for a fill.



Hartford Way Department—Details of Filter Block and Washer for Guard Rail

Track drainage is a very important consideration in Hartford owing to the fact that the underlying soil is a clay. The foundations of all track within a width of 9 ft. 9 in. are therefore pitched 2 in. to 3 in. to 6-in. tile drains, which are connected directly to the city sewers at all low points. The surface water at low points is disposed of by iron-grated concrete track drains, which are placed between the rails and which are usually connected to both the 6-in. tile drains and the sewers, thus affording a double outlet. A plan and section of one of these standard track drainage basins is shown in the accompanying illustration.

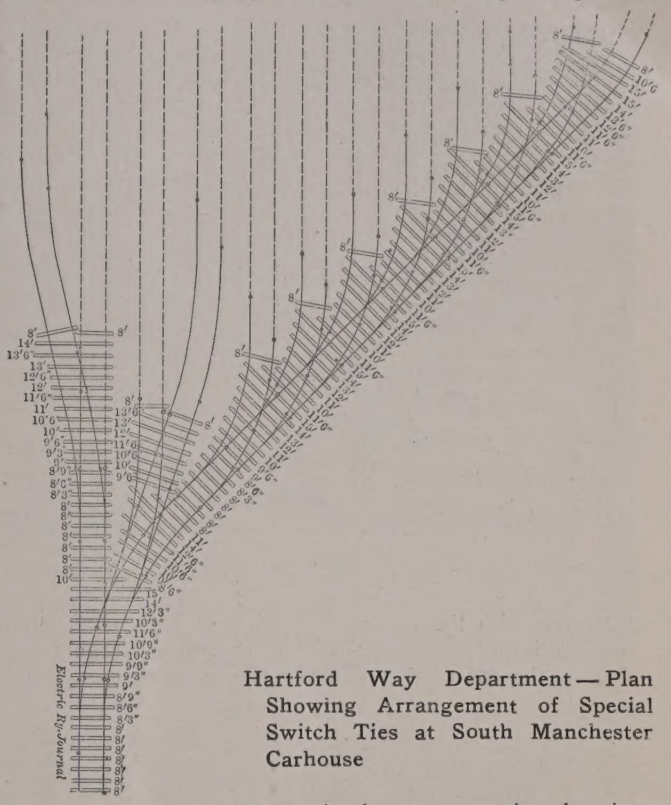
Another view shows the guard-rail filler block which is adapted to fit a wide variety of T-rails, since a constant width of about 1½ in. is secured between the heads of both rails for all combinations. The block is made of cast iron. A malleable iron washer, as shown in the drawing, is used with the block wherever an M.C.B. flangeway is required. More than 10,000 of these filler blocks, as made from the company's patterns, were installed during the last two years alone. As shown in another drawing, the filler block is installed with a 6-in. x ⅞-in. machine bolt. The hole for the guard-rail bolt is drilled as high as possible in the main rail and as low as possible in the guard rail. The filler blocks are spaced not more than 36 in. center to center.



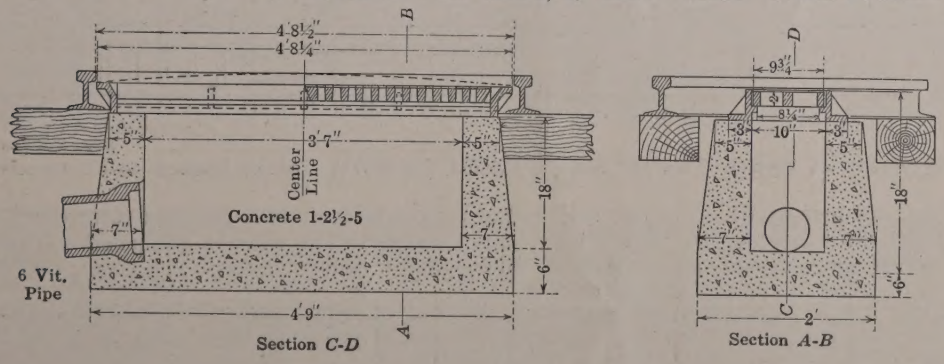
Hartford Way Department—Standard T-Guard Rail Layout with Filler Block

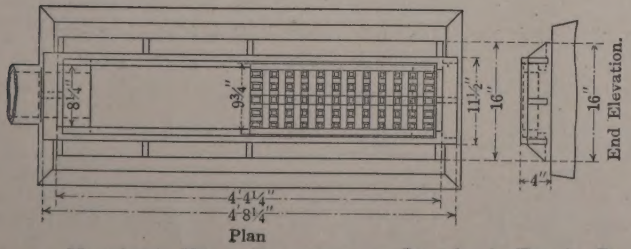
SPECIAL WORK INSTALLATIONS

An interesting feature of the special work installations in Hartford is the use of special switch ties in order to afford a uniform support for the special work, thereby minimizing the shocks which decrease its life. The way this practice is carried out is well shown in the accompanying drawings of switch layouts for a 200-ft. radius cross-over and for the twelve-track entrance to the South Manchester carhouse. It will be seen that the ties vary in length from the standard of 8 ft. to fully 18 ft. There has been no difficulty in getting the desired length of timber for a difference in price which is very reasonable in comparison with the beneficial results obtained from using ties which are specially adapted for the conditions, instead of laying the ordinary lengths haphazard. The appearance of the completed job in front of the South Manchester carhouse is shown in a halftone on the next page.



Hartford Way Department — Plan Showing Arrangement of Special Switch Ties at South Manchester Carhouse





NOTE

Materials: Concrete, 1 Cement, 2½ Sand, 4 Broken Stone. Grating and Frame Tough Gray Cast Iron.

Quantities:

Concrete	13 cu. ft.
Grating Frame	180 lb.
Grating 2 Pieces	170 lb.

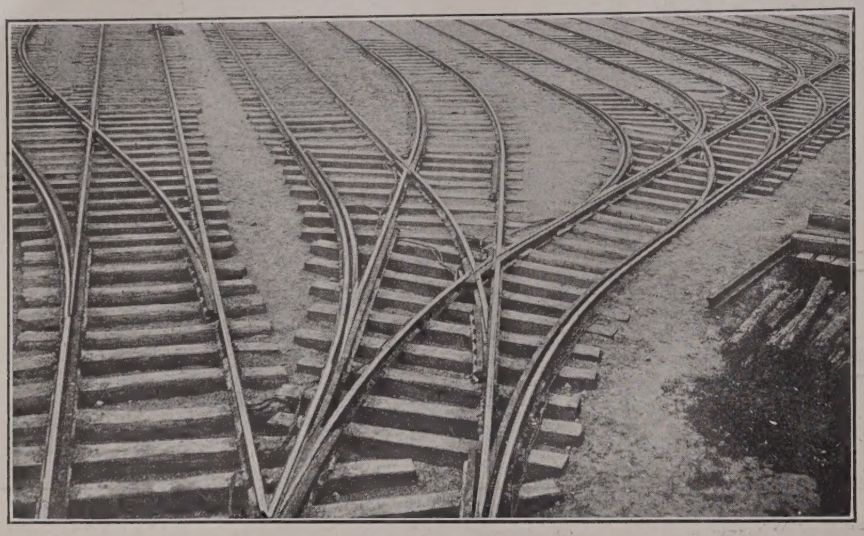
Electric Ry. Journal

Hartford Way Department—Standard Track Basin and Grating

The largest special work installation in Hartford is the loop around the city hall and post office, including its connections to the nearby State Street carhouse, as shown in the plan on page 874. Most of the special work in the loop is of the Pennsylvania Steel Company's Manard steel center construction, while the entrance to the carhouse was furnished by William Wharton, Jr., & Company. Although Hartford is not a very large city, it is said that the concentration of traffic over this loop is more intense than anywhere else in the world. This appears probable from the fact that during regular service the special work at the Main and Pearl Street corner of the loop accommodates about 130 cars an hour for regular service and about 180

cars an hour during periods of maximum traffic. It may be noted here that an ideal condition for the handling of rush-hour traffic is afforded by the fact that the State Street carhouse is so near the traffic center.

This important layout was installed in 1910 without interfering with the regular operation of cars, even where the location of the new special work differed largely from that of the old work. The regular standard construction was used throughout the installation, one-half of which is paved with grouted granite block and the remainder with asphalt. Switch ties were used on the entire layout, and these were of great assistance in holding the layouts in good position for immediate operation.



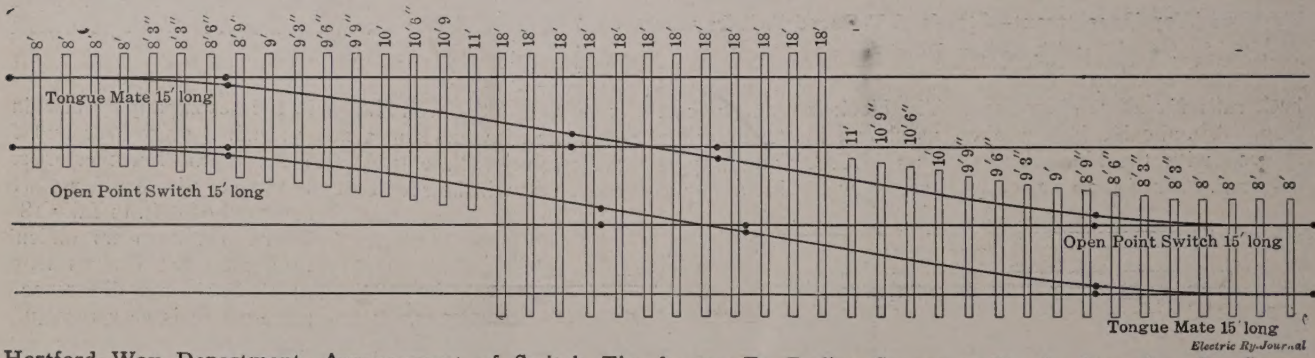
Hartford Way Department—Switch-Tie Layout at South Manchester Carhouse

A tool which the department has found very useful in connection with miscellaneous grinding for joints and special work is the No. 10 Stow grinder which is illustrated on the opposite page in use on a frog center resetting job. This grinder is used not only for smoothing out old track but also for grinding down new special work to avoid such rough spots and slight variations in grade as would cause wheel binding. This work is done immediately after the first cars are run over the special work. This grinder is not intended for exceedingly fine work, but the men are skilful enough to use it effectively for other work like removing rough spots on joints. The McCloud furnace shown in the same view has two torches, one for heating and the other for attachment to a spelter melting outfit.

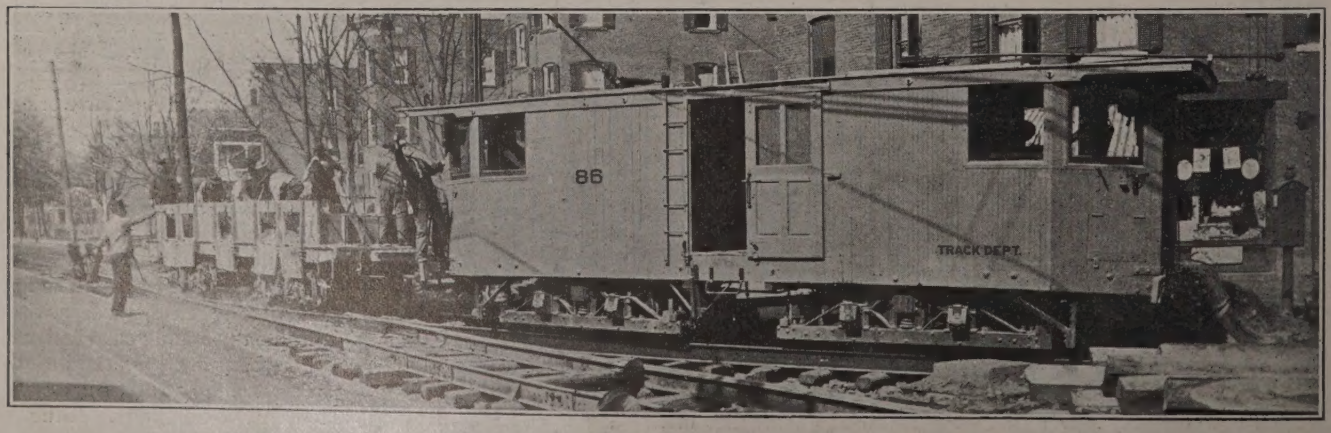
SPECIAL CARS

Under the direction of C. F. Gailor, roadmaster at Hartford, a number of special cars have been developed for the use of the track department, as shown in the accompanying illustrations.

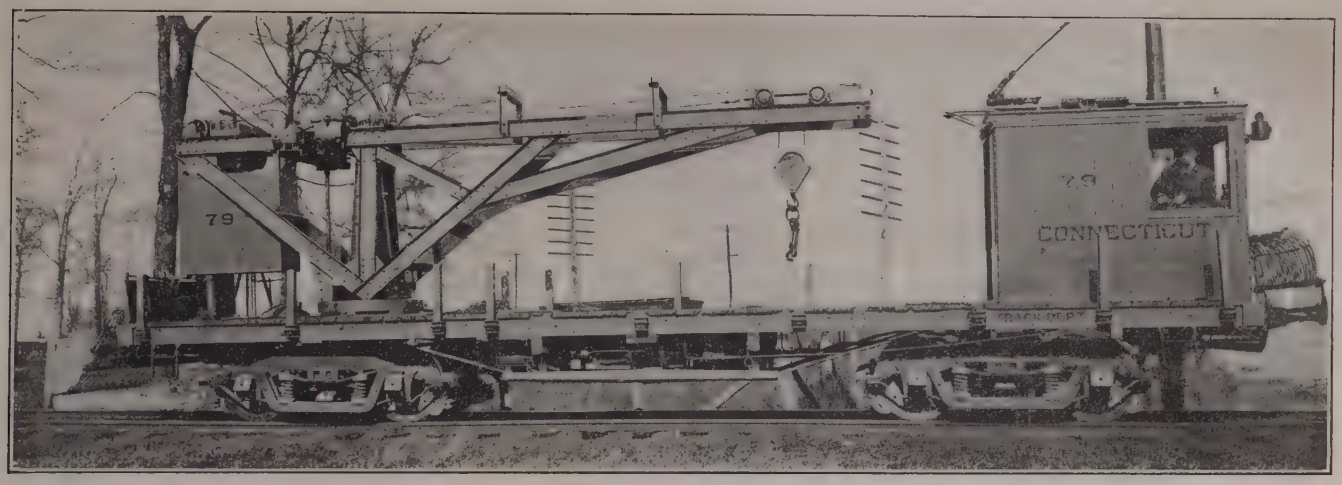
Two views are presented of an electrically operated crane car, the equipment for which was furnished by the Whiting Foundry & Machine Company about three years ago. The car is 43 ft. 6 in. over the end sills and is mounted on special Standard motor trucks spaced 25-ft. centers. A cab at one end contains all the electrical apparatus for the control of the crane. A controller is provided, however, at each end of the car to avoid backing up, a feature which eliminates much danger. The traction equipment consists of four Westinghouse 101-B motors. This car can be used up to capacities of 80,000 lb. The boom has a radius of 20 ft. with cable enough to draw material which is 25 ft. away. The crane has a capacity of 6 tons. Three tons of the load are counterbalanced in the crane itself.



Hartford Way Department—Arrangement of Switch Ties for 200-Ft. Radius Crossover Tracks Spaced 10-Ft. Centers



Hartford Way Department—Distribution of Ballast from Special Car



Hartford Way Department—Crane Car for Special Work Transportation and Other Jobs

Hartford Way Department—Grinding Down Special Work

Hartford Way Department—Crane Car Handling a Special Work Replacement

The crane car handles all kinds of heavy track material, including special work, motors and other electrical equipment, heavy scrap material, etc. It is also used for such odd jobs as pulling out tree stumps. The labor-saving value of this car is indicated by the fact that four men have

Hartford Way Department—Rocker-Type Dump Cars

unloaded 200 tons of 50-ft., 125-lb. rails and stored them alongside the roadway in ten hours, at a labor cost of 5 cents per ton, compared with $1 per ton when the work was done on a contract basis by physical labor alone. Furthermore, the car eliminates hospital expenses for the mashed fingers and toes which are almost unavoidable when the work is done entirely by hand.

With this car it is possible to take out a regular double-track branch-off special work layout, remove the old branch-off and put in the new switch ties and special work in from four to five hours. This means that the job can be done between 12:30 a. m. and 5 a. m. at the latest, thereby causing practically no delay to traffic. No number of men, no matter how large, could handle a similar job in equal time. The procedure with the crane car is as follows:

First, all the new special work is placed on the car. Then the car is run out to the job, where a couple of flat cars are ready to take away the abandoned piece. The switch ties and ballast are then laid according to a special plan, after which the special work is put in place. In the meantime the old material has been taken away and soon the street has been cleaned up entirely.

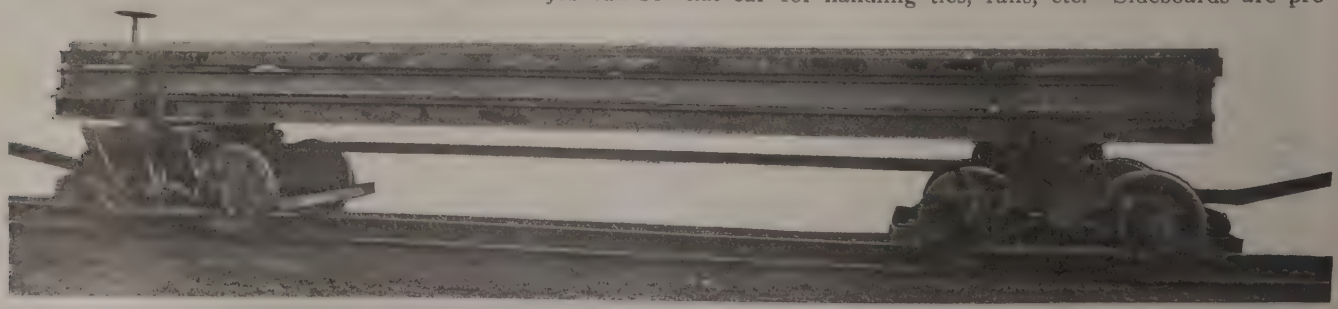
Accompanying views show one of the two types of cars used for distributing ballast, coal, etc. These cars hold about 12 cu. yd. each. They are so constructed as to empty themselves completely, but if the material is to be used on either side of or in the middle of the track, only one-half to three-quarters of the load will dump and the remainder must be poked or shoveled out. The car which is being unloaded shows five doors open and two blind panels, while the car shown at the crusher plant has four doors and four blind panels on each side. On the later models there are eight doors, four on each side, and eight chutes in the bottom, so that upon opening the sides only the material in the middle of the car will not dump. Ordinarily, a work train crew consisting of a motorman and three brakemen unload two of these cars in from three to five minutes.

The other dump cars, which are of the rocker two-way dump type, are of 5½-yd. capacity each. These cars were built by the Wason Manufacturing Company under the railway company's supervision. They are equipped with a short toe beam which permits material to be thrown free from the rail upon which the car is standing. A car is dumped by means of dumping bars by two men. Only three to six minutes is required for three brakemen to dump and right a train of four cars. Ten of these cars are used by the track department and thirty more by the freight department for the commercial transportation of trap rock. The track department has its own supply car, which is very similar to the one shown on page 538 in the Electric Railway Journal for April 6 in the description of the Hartford car shop practices of this company.

Hartford Way Department—Side Dump Car for Carrying Coal and Ballast

Hartford Way Department—Double-Cab Car, Used Flat and with Sideboards

A view on this page shows a home-made double cab and flat car for handling ties, rails, etc. Sideboards are provided for use when the car is required for handling crushed stone, paving block, brick, etc. This car is also used for handling freight. Its capacity is up to 40 tons, which was made possible by using the double truss-rod construction shown. The cabs are so built that three pairs of 50-ft. lengths of 125-lb. rail can be placed on each side in emer-



Hartford Way Department—Double-Truck Rail Carrier

gencies. The car is 32 ft. long between the faces of the cabs and 48 ft. long over all. It is mounted on Standard trucks equipped with four GE-80 motors.

Perhaps the most interesting special car is a rail carrier, which can hardly be called a car. It consists practically of two trucks, the bolsters of which have a cradle connected by a reinforced steel bridge of T-section. A drawbar is attached to each truck. The distance between the tracks can be lengthened to 32-ft. centers or shortened to accommodate rails 24 ft. long. Some care is required in handling this combination around short curves on account of the clearances when the truck centers are 32 ft. apart. At the yard the rails are stored in steel cribs at breast height, thus enabling the workmen to slide them on to the rail carrier with so little effort that one motorman and three brakemen can load and distribute on the work fifteen to twenty 50-ft. rails in one hour.

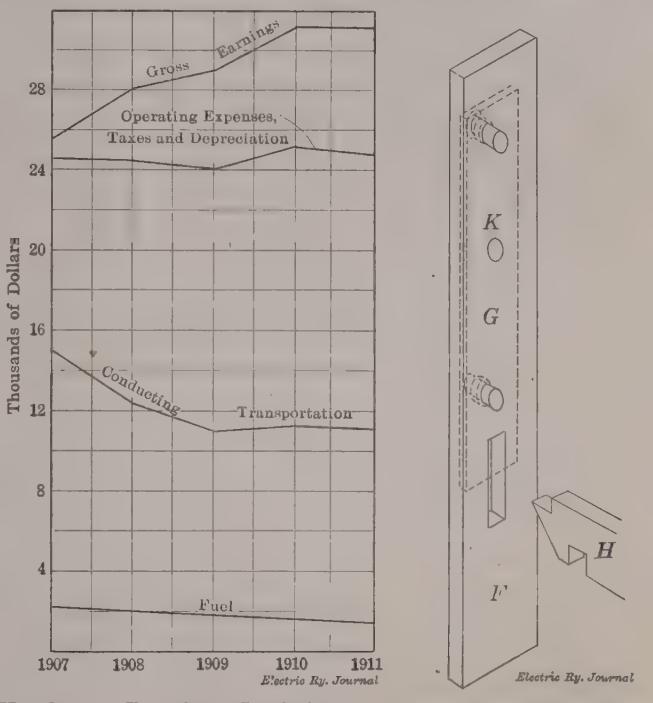
RAILWAY OPERATION IN HENDERSON, KY.

BY GEORGE H. LYNE, RECENTLY SUPERINTENDENT HENDERSON TRACTION COMPANY

Doubtless, difficulties arise in the operation of large railways which have no counterpart on the smaller systems, but it is none the less true that most operating difficulties which are found on the large railways are to be found on the smaller ones also. There are also some troubles which beset the operator of the small railway exclusively. The underlying cause of these is the exceedingly low traffic density during the greater part of the time. On a small road no attempt can be made to vary the car miles in accordance with the traffic, for if this were done the headway would generally be so greatly lengthened that the usefulness of the cars would be destroyed and all business would be lost.

On the system of the Henderson Traction Company, with which the writer was connected, the conditions are such that it is a practical necessity to operate not less than six or seven cars while doing scarcely enough business to justify the running of three or four. The city of Henderson lies at the southern point of the Ohio River and occupies about 3 sq. miles of gently rolling land. According to the census of 1910 it has a population of 11,452. The fair grounds, at which county fairs and baseball games are held, are far enough from the center of the town to make them of considerable value as traffic stimulators, and there is one park which during the summer is a source of revenue.

The Henderson Traction Company was organized in 1907 and has a capital stock of $150,000 and a bond issue of $105,000. At the time of its reorganization it was not in good physical condition and to make the situation worse there was a strike among the company's motormen in October of that year. The strike lasted six weeks, and at its termination the company could see fit to re-employ only four of its strikers. Hence the company began the year 1908 under disadvantageous conditions, but by curtailing expenses in every way it was able to meet the semi-annual bond interest falling due in April. A number of improvements in the physical equipment were made during the year and resulted in a gain in receipts, and by the end of the year a small cash balance had accumulated. The purpose of the present article is to describe some of the improvements which have been made during the past three years, and it is hoped that the account will prove of interest to other small roads.



Henderson Traction—Statistics of Operation and Latch for Pantograph Gate

Henderson Traction—Car Before Equipment with Steel Side Panels

Henderson Traction—Car After Equipment with Steel Side Panels

All of the trolley curves have now been rebuilt with new copper and modern pull-overs. The curve and switch poles have been effectively guyed where possible, and almost all of the span wires have of necessity been renewed. About three-fourths of the track has been re-equipped with ties, many of the joints have been improved mechanically, and

most of them have been bonded effectively. In 1909 a quarter of a mile of 70-lb. steel was laid and 2 miles of new trolley wire has been put up.

A reference to the accompanying graphic report shows that gross earnings have gradually increased while the population served has remained constant. While the expense of conducting transportation has declined to some extent, operating expenses as a whole have not varied much. This is due to the fact that on account of the run-down condition of the property it was considered expedient to charge many permanent improvements to maintenance. In explanation of the large portion of earnings expended for conducting transportation, it may be remarked that, although conductors are not employed, the traffic is so light during the greater part of the time that trainmen's wages alone amount to one-fourth of the company's gross earnings.

Progress from now on ought to be much more rapid. Operating expenses will be less on account of the improvements already made, and earnings will be swelled by a percentage of receipts which will now be received under contract with an interurban company which will operate between Henderson and Evansville.

It would probably be guessed that there would not be many unique or interesting operating practices in vogue on a property as small as this. Lack of means has often prevented the adoption of apparatus well calculated to secure greatly increased economy. Shop facilities are limited, a small lathe, drill press, emery wheel and power hack-saw being the only machine tools in the shop. Air for blowing out motor cases is supplied by a small air-brake compressor.

In 1910 the company adopted the "pay on platform" method of fare collection. This made it necessary to have all passengers board and alight at the front end of the car, as conductors are not employed. As the cars are double-end operated, it was necessary that the rear platform be closed by a gate secured in such a way as to be readily opened by the motorman, but with difficulty by unauthorized persons. The rear ends of some of the cars were closed by pantograph gates, and for these the company manufactured suitable latches at a cost of 30 cents each. These consist of a face plate pierced by an oblong hole of suitable size to receive a hook which is riveted in the frame of the gate. Passengers are prevented from unfastening the gate by the guard plate which is fastened loosely to the face plate by two pins and held against it by an old sash spring. When the motorman unlatches the gate he pushes the guard plate back by means of a pin set in his reverse lever. For this purpose the keyhole is pierced through the face plate. The latch is set in a mortise in the corner post of the vestibule and presents a very neat appearance. Very little trouble has been experienced through the unlatching of the gate by passengers.

The company is now rebuilding five of its cars. These are the ones purchased in 1904, rebuilding at this time being necessitated by the breaking of their corner posts. The broken posts are being replaced with new ones made 1 in. thicker for the purpose of securing greater stiffness. The side posts are in good condition, so it is not necessary to replace them, but as the old wooden panels are being replaced with steel ones it is necessary that spacing blocks be fastened to the cove-cut portions to bring their outer edges in line with those of the corner posts. New floors are being put in, and all rotten framing is being replaced.

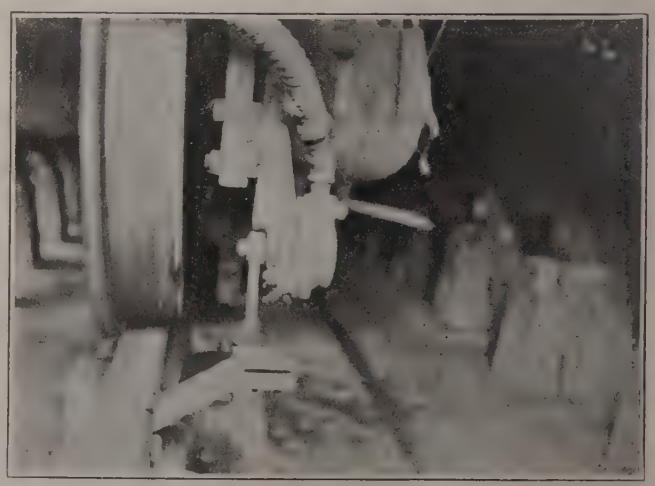
Heater wires up to this time have been carried in metal molding laid along the floor but have from time to time given trouble through short-circuits when installed in this manner. To obviate further trouble of this sort flexible steel-armored, lead-covered cable is now being used for the heater circuits, the cable being carried between the inner and outer panels. The cars are being refinished, inside and out, the cost of the work, including painting, being about $250 per car. All of the work is being done by the company's shop employees, under the direction of O. U. Long, shop foreman. The exterior appearance of the cars before and after rebuilding is shown in the photographs on the preceding page.

Great difficulty is generally experienced in securing enough capable trainmen to handle the cars on special occasions. This is especially true when the county fairs are in progress. On July 27, 1908, the company carried 8600 revenue passengers, more than six times the average daily number for the year. Thirty per cent of these were carried in the three hours between 3:30 and 6:30 p. m., so it will be seen that the company's facilities were taxed to the utmost. For the 1910 fair the plan of inclosing the terminus of the line was tried. The scheme worked well, not only insuring the collection of all fares, but also minimizing the number of men required during the rush hours. The fares were collected by a man at the entrance of the inclosure. Unfortunately, the fence was located on land belonging to the county, and permission to continue it in use could not be obtained.

For keeping account of motorman's time the company uses an 8-in. x 13-in. specially ruled sheet. "On" and "off" times are copied from the trip-sheets and each man's time is figured and sub-totaled day by day. The sum of the sub-totals of all the men is daily checked against the car hours for the half month, and in this way many clerical errors are avoided. As conductors are seldom employed, their time cannot be thus checked, but in the case of any road employing conductors on all cars the plan could be used for them as well as for motormen.

TELLTALE FOR TRIPPER SIGNAL

The Hudson & Manhattan Railroad, New York, has installed at its Jersey City shops a signal tripper, as shown in the accompanying illustration. This tripper, which is attached to one of the rails, consists of a metal bracket on which a shimmed square plate is carried. Every car which



Stop for Gaging Signal Tripper of Automatic Safety Stop

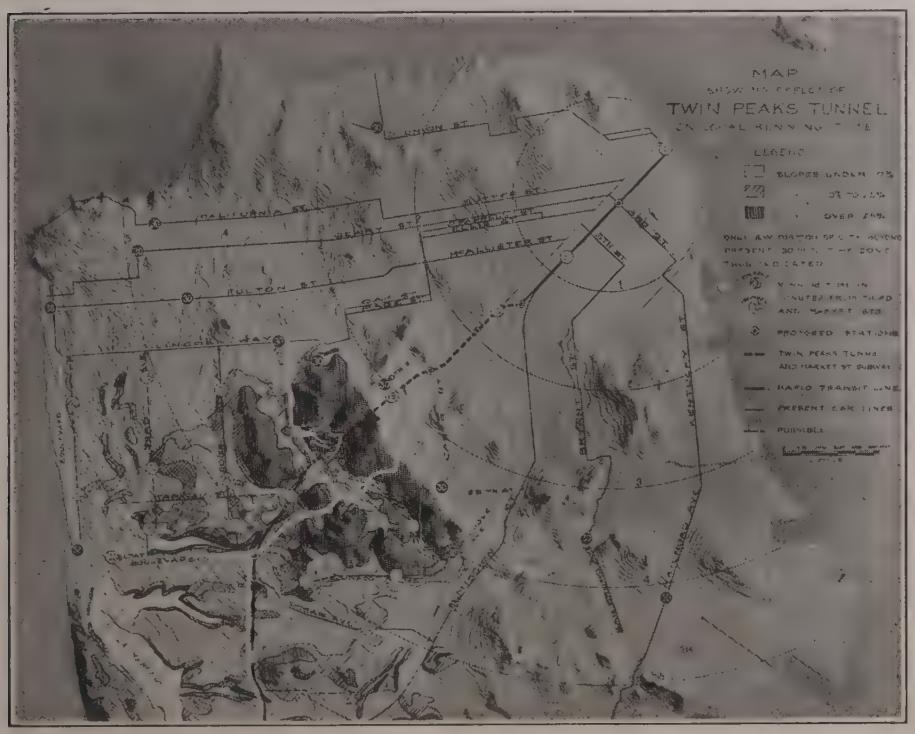
leaves the shops for operation is obliged to pass the point where this tripper is installed, and if the tripper of the automatic stop mechanism on the car is too low it will, of course, be intercepted by the adjustable plate and bring the car to a stop.

One of the ten cars purchased by the Lehigh Valley Transit Company for its limited service between Allentown and Sixty-ninth and Market Streets, Philadelphia, via Norristown and the Philadelphia & Western Railroad, was exhibited by the company at the recent fair in Allentown. The car was run into the fair grounds on a temporary track.

REPORT ON MARKET STREET RAPID TRANSIT TUNNEL

A report was submitted Oct. 7 to the Board of Supervisors of the city of San Francisco by Bion J. Arnold on the proposed rapid transit tunnel extension under Market Street. It was entitled "Preliminary Report No. 8" and supplemented "Preliminary Report No. 5," submitted to the board on May 3. It provides in general for a two-track subway under upper Market Street to be used for local service with ultimately a second lower high-speed subway under the local subway and extending down Market Street to the ferry for express service. The general route with present and proposed running times is shown on the accompanying map.

The subway for local service is to be used by trolley cars, but will be designed large enough for the largest rolling stock which will probably be used in the future—that is, high-speed multiple-unit trains. Hence it will be 25 ft. in width and 14½ ft. in height. To provide platforms for both types of rolling stock two platforms will be built at different levels and arranged in tandem, one 3 ft. 6 in. from the rail head and the other 15 in. from the rail head. The report recommends the use of the third-rail system of current collection, although room has been provided for trolley.



Map of Proposed Subway—San Francisco

CAR WASHING ON THE CHICAGO RAILWAYS

In the article entitled "Chicago Railways' Methods of Washing and Cleaning Cars," on page 831 of the ELECTRIC RAILWAY JOURNAL for Oct. 11, a typographical error appears in the first paragraph below the caption "Essentials in Good Soap." At the end of the second line this reads "Soap shall have no alkaline reaction." It should read "Soap shall have an alkaline reaction." Although free alkali is injurious except in the smallest amounts, the soap must be alkaline in character and must so indicate under test.

The Ohio Electric Railway Company, Cincinnati, Ohio, has issued a new map, showing its entire system, with connections in Ohio, Indiana and Michigan.

STEEL TIE AND CONCRETE TRACK CONSTRUCTION AT SPRINGFIELD, MO.*

BY A. C. POLK

In this paper the writer has attempted to give a general description of the methods and materials used at Springfield, Mo., in rebuilding the Springfield Traction Company's lines on streets which were being paved by the city during 1911. The company's franchise stipulates that it shall pave the space between its rails and for 2 ft. outside of the rails when the city paves on the various streets occupied. The work aggregated more than 3 miles of new track. It was desired to secure as permanent a roadbed as possible, in fact, one which would outwear the rail itself and allow its replacement without disturbing the roadbed if so desired. The engraving on page 884 shows a general cross-section and detail of the work as put in.

GENERAL CONSTRUCTIONAL FEATURES

The general features of the structure were a 7-in., 70-lb. T-rail section, 62 ft. long, laid on steel ties, and, directly under each rail, longitudinal concrete beams, each reinforced with two 1½-in. twisted steel rods, and a 5-in. concrete mat over the beams and the center of the tracks for a paving foundation. In this case the city contractors were allowed to place the street pavement first, except where it was of asphalt. After the paving on each side of the track had been completed, the old track was moved to one side or the other on the completed pavement, and excavation between the tracks was commenced.

The standard depth below the finished pavement to which the general excavation was made over the whole 9-ft. space was 10 in. Then two trenches were excavated to exact dimensions, a depth of 9 in. more, and running with the rail. At the joints these trenches were connected by cross trenches, 30 in. wide, at an additional depth of 3 in., so that each joint tie would be thoroughly embedded and have a good thickness of concrete under it. Around each intermediate tie shallow trenches were excavated, so that there would be at least 2 in. of concrete under the tie and 4 in. around its sides.

All ties were punched at the proper gage to take 7-in. 70-lb. or 80-lb. T-rails, but the 70-lb. rail was used principally. There were two types of ties, one under the joints which came opposite one another, and the other intermediate between them. The joint tie was an I-beam section, weighing 20 lb. per ft., 6 ft. 8 in. long, having an 8½-in. top, on which the joint rested, and a 4½-in. base. The intermediate ties were of the same length, but weighed 14½ lb. per ft. and had a 6-in. top and a 4-in. base. All ties were spaced 5 ft. apart, or as near that as the distance between joints would permit.

FASTENINGS AND JOINTS

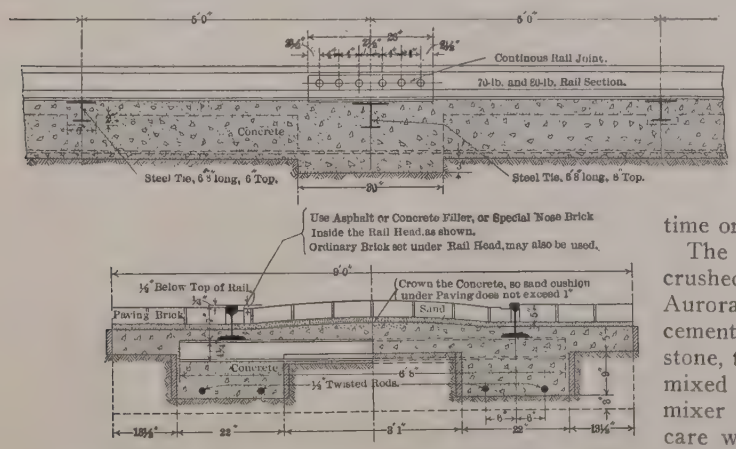
The rail was fastened to the tie by special lugs and T-headed bolts with square shoulders next to the head. These bolts could be inserted from the top, if so desired,

*Abstract of a paper presented Oct. 16, 1912, before the American Society of Civil Engineers, and printed in full on pages 791 to 797 of the Society's *Proceedings* for August, 1912, under the title of "A Brief Description of a Modern Street Railway Construction."

being dropped through the rectangular hole punched in the tie, turned and then raised until the square shoulder fitted up into the rectangular hole, which prevented it from turning while running down the nuts. The lug had a projection on its under side which also fitted into the rectangular hole and prevented it from turning or backing off the rail. A socket wrench was used to run down these nuts rapidly. The joint ties were heavier and wider than the intermediate ones, as noted above, and were punched to allow the lug to fasten over the continuous joint which was used.

Six-bolt continuous joints were used, and the following method of making them was adhered to with greatest care, as the joint is generally the weak part of the track work:

First, those parts of the rail with which the joint came in contact were carefully cleaned and polished with files and emery cloth until all scale, rust and particles of dirt were removed and the surface was bright. Then those parts of the joints which came in contact with the rail received the same treatment. All contact parts were then greased and the joint put on. The tightening of the bolts was started from the center, working out toward the ends, pulling up a bolt on one side of the center and then the corresponding bolt on the other side, and when the bolts were all apparently tight a heavy sledge was held against the


5'0"
5'0"
Continuous Rail Joint.
70-lb. and 80-lb. Rail Section.
Concrete
Steel Tie, 6'8" long, 6" Top.
Steel Tie, 6'8" long, 8" Top.
Use Asphalt or Concrete Filler, or Special Nose Brick Inside the Rail Head, as shown. Ordinary Brick set under Rail Head, may also be used.
¼" Below Top of Rail
Crown the Concrete, so sand cushion under Paving does not exceed 1"
Paving Brick
Sand
Concrete
½" Twisted Rods
22"

Concrete Track Construction at Springfield, Mo.

bottom of the joint on one side and the other side tapped briskly with a light sledge at the bottom only, and vice versa.

Then the tightening process was repeated until nothing more could be got out of the bolts by one man with a wrench having a 30-in. handle. After a continuous joint has once been carefully made in this manner it is there to stay, and even if the bolts were removed, the joint would remain under traffic for a long period without any signs of loosening. Another feature in making a joint of this type in this manner is that no bonds were used, or considered necessary. The net area in contact has a far greater current-carrying capacity than the No. 0000 copper bond generally used on heavy lines, and a test showed no trouble with return circuits. It has also been brought to the writer's attention that a section of track put down in a similar manner showed a first-class negative return circuit after two years under traffic.

CONCRETE WORK

The track, having been put together as described, was supported on small piers of old brick placed under every other tie, and centering under the rail. The final surfacing was done with oak wedges on top of these piers, and both the piers and wedges were concreted in. Two ½-in. twisted steel rods were placed in the bottoms of the trenches, about 6 in. apart. These also were supported at intervals on top of a brick which held them about 2½ in. off the ground. Under each joint two extra 4-ft. lengths of these steel rods were placed to give additional strength at this point, which is usually considered the weak spot of track construction.

The track then received its first surfacing raise, being brought approximately to grade. Afterward a second finishing surface and true grade was secured by driving up the oak wedges. This final surface, however, was only kept a short distance ahead of the mixer on account of the difficulty in keeping the skeleton track in correct line, as variations in temperature kinked it.

Concreting was next started, two types of mixers being used on this particular work at different times: One was mounted on car trucks and driven with a 10-hp motor; it occupied the temporary old tracks which had been previously placed at one side, and was supplied by a regular work train, which delivered the concrete material on flat cars. The other type was mounted on wide-tired wheels, driven with a 15-hp, 500-volt d. c. motor, and was equipped with a charging bucket. All materials for the latter were hauled in wagons to the streets and dumped ahead of the mixer in such manner that they were about in the right proportions. These materials were cleaned up as the mixer progressed.

Of the two methods, the latter was found to be by far the most satisfactory, as there were frequent delays in the delivery of materials to the first mixer by the work train, and the temporary track was blocked for traffic beyond the point where concreting was in progress and, on single-track work, passengers had to transfer around the obstruction. In the second method, all material could be delivered on the street for a considerable distance ahead of the mixer, and there was no reason for the mixer to be idle at any time on this account.

The concrete was composed of 1½-in. (maximum size) crushed limestone, Kaw River sand and chats from the Aurora zinc mine district, the proportions being one of cement, two of sand, two of chats and three of crushed stone, this making a very good mixture. The concrete was mixed very wet, dumped into movable chutes from the mixer and deposited directly by them on the track. Great care was taken at all times to keep all loose material in the excavation cleaned up ahead of the concrete and to maintain the twisted steel rods in their proper positions. The concrete was puddled carefully under and around all ties with shovels and finally crowned, when it reached grade, with a special board or templet made for the purpose.

When the material through which excavation had been made was of a very loose character, or if bad weather had caved in the sides of the trench, forms were placed where necessary to hold the concrete to the exact dimensions of the roadbed. After the concrete had set for forty-eight hours, and in the majority of cases longer, the brick paving was done.

PAVING

The paving was of first-class paving blocks, laid on a 1-in. sand cushion, and grouted. The method of laying it differed somewhat from the usual practice. Along each rail, and snug up against it, was laid a 2-in. x 4-in. piece of timber. A stretcher course of bricks was then laid against it, paralleling the rail, the tops of the bricks being only ½ in. below the top of the rail. The headers across the tracks were then laid and all the bricks were thoroughly rolled and rammed.

Before grouting, the 2-in. x 4-in. piece was removed and the space thus left was filled with concrete to a plane 1 in. below the top of the rail, forming the flangeway for the wheels. After this had set, the whole pavement was grouted thoroughly and carefully. When filled up, the grout remaining over the top of the pavement was allowed to stand until it had attained a set and was fairly stiff,

when dry sand was sprinkled over it and the whole was swept thoroughly with wire brooms, thus removing all surplus grout sticking to the tops of the bricks.

COST

The cost of track construction of this type for paved streets, including the paving between and for 2 ft. outside of the rails, using the 70-lb. high T-rail, under the conditions at Springfield, was approximately $5 per ft. of single track. This cost may seem to be high, but when the permanent character of the work is taken into consideration and the cost of doing street work under other methods is analyzed and compared it will be found to be very reasonable. It possesses several advantages over some of the methods in vogue. It takes less concrete than the old method of filling under and around wooden ties. It places the concrete and the strength where most needed, and the roadbed will easily outwear two or more sets of rails under heavy traffic. The rail can be charged without disturbing the roadbed in the least, if proper provisions have been made in the steel ties originally.

The work was done by the Springfield Traction Company, owned and operated by the Federal Light & Traction Company, New York, and was executed under the general direction of W. A. Haller, chief engineer, the writer being in immediate and full charge of all construction matters at Springfield, Mo.

COMPILATION OF PUBLIC UTILITY LAWS

The work on the compilation and analysis of public utility regulation laws of the United States which is being conducted by the Department on Regulation of Utilities, National Civic Federation, is progressing rapidly. Of this department of the National Civic Federation, Emerson McMillin is chairman and John H. Gray is director of investigation. The department proposes to publish its report in fifteen parts. It has already issued in preliminary form two of these parts and has distributed them to interested persons for suggestions and criticisms and subject to subsequent additions, deductions and alterations.

The first of these reports was published early in August and was mentioned on page 252 of the issue of this paper for Aug. 17. It was devoted to an analysis of the laws of the different states upon the subject of accounts of public utility companies. The second pamphlet has just been published and discusses the organization of commissions. The main headings tentatively adopted for a consideration of this subject are as follows: Name and constitution of commission; quorum of commission; oath of office of members; removal or suspension of members; manner of filling vacancies; right to sue and be sued; official seal; disqualifications for membership; official and private relations of members and employees with utilities; authority to en-

RAILROAD AND PUBLIC SERVICE COMMISSIONS.

	Name of Commission	Location of Office	Number of Commissioners	Manner of Selection	Terms of Office in Years	Salaries of Members	Bonds of Members
United States	Interstate Commerce Commission	Washington, D. C.	Seven	Appointed	Seven	$10,000	.....
Alabama	Railroad Commission of Alabama	Montgomery	Three	Elected	Four	3,000	.....
						3,500[1]	
Arizona	Corporation Commission	Phoenix	Three	Elected	Six	3,000	.....
Arkansas	Railroad Commission of Arkansas	Little Rock	Three	Elected	Two	2,500	.....
California	Railroad Commission of the State of California	San Francisco	Five	Appointed	Six	6,000	.....
Colorado	State Railroad Commission of Colorado	Denver	Three	Appointed	Six	4,000	.....
Connecticut	Public Utilities Commission	Hartford	Three	Appointed	Six	5,000	.....
Florida	Railroad Commission of the State of Florida	Tallahassee	Three	Elected	Four	2,500	.....
Georgia	Railroad Commission of Georgia	Atlanta	Five	Elected	Six	2,500	.....
						4,000[1]	
Illinois	Railroad & Warehouse Commission	Springfield	Three	Appointed	Two	4,000	$20,000
						6,000[1]	
Indiana	Railroad Commission of Indiana	Indianapolis	Three	Appointed	Four	4,000	10,000
Iowa	Board of Railroad Commissioners	Des Moines	Three	Elected	Three	2,200	.....
Kansas	Public Utilities Commission	Topeka	Three	Appointed	Three	4,000	10,000
Kentucky	Railroad Commission	Frankfort	Three	Elected	Four	3,000	.....
						3,600[1]	
Louisiana	Railroad Commission of Louisiana	Baton Rouge	Three	Elected	Six	3,000	.....
Maine	Board of Railroad Commissioners	Augusta	Three	Appointed	Three	2,000	.....
						2,500[1]	
Maryland	Public Service Commission	Baltimore	Three	Appointed	Six	5,000	.....
						6,000[1]	
Massachusetts	Board of Gas & Electric Light Commissioners	Boston	Three	Appointed	Three	4,500	.....
						5,000[1]	
	Board of Railroad Commissioners	Boston	Three	Appointed	Three	5,000	.....
						6,000[1]	
	Massachusetts Highway Commission	Boston	Three	Appointed	Three	4,000	.....
						5,000[1]	
Michigan	Michigan Railroad Commission	Lansing	Three	Appointed	Six	3,000	.....
Minnesota	Railroad & Warehouse Commission	St. Paul	Three	Elected	Six	4,500	20,000
Mississippi	Mississippi Railroad Commission	Jackson	Three	Elected	Four	2,000	.....
Missouri	Board of Railroad & Warehouse Commissioners	Jefferson City	Three	Elected	Six	3,000	20,000
Montana	Board of Railroad Commissioners of the State of Montana	Helena	Three	Elected	Six	4,000	25,000
Nebraska	Nebraska State Railway Commission	Lincoln	Three	Elected	Six	3,000	.....
Nevada	Railroad Commission of Nevada; Public Service Commission of Nevada	Carson City	Three	Appointed	Three	2,500[2]	.....
						4,000[3]	
						5,000[1]	
New Hampshire	Public Service Commission	Concord	Three	Appointed	Six	3,000	
						3,200[4]	
						3,500[1]	
New Jersey	Board of Public Utility Commissioners	Trenton	Three	Appointed	Six	7,500	.....
New Mexico	State Corporation Commission	Santa Fe	Three	Elected	Six	3,000	.....
New York	Public Service Commission, First District	New York	Five	Appointed	Five	15,000	.....
	Public Service Commission, Second District	Albany	Five	Appointed	Five	15,000	.....
North Carolina	Corporation Commission	Raleigh	Three	Elected	Six	3,500	.....
North Dakota	Board of Railroad Commissioners of N. Dakota	Bismarck	Three	Elected	Two	2,000	10,000
Ohio	Public Service Commission of Ohio	Columbus	Three	Appointed	Six	6,000	.....
Oklahoma	Corporation Commission	Oklahoma City	Three	Elected	Six	4,000	.....
Oregon	Railroad Commission of Oregon	Salem	Three	Elected	Four	4,000	10,000
Pennsylvania	State Railroad Commission	Harrisburg	Three	Appointed	Five	8,000	.....
Rhode Island	Public Utilities Commission	Providence	Three	Appointed	Six	3,500	.....
						4,000[1]	
South Carolina	The Railroad Commission	Columbia	Three	Elected	Six	1,900	.....
	Public Service Commission		Three	Appointed	Six	10 per diem	1,000
South Dakota	Board of Railroad Commissioners of the State of South Dakota	Pierre	Three	Elected	Six	1,500	5,000
Tennessee	Railroad Commission of the State of Tennessee	Nashville	Three	Elected	Six	2,000	20,000
Texas	Railroad Commission of Texas	Austin	Three	Elected	Six	4,000	.....
Vermont	Public Service Commission	Newport	Three	Appointed	Six	1,700	.....
						2,200[1]	
Virginia	State Corporation Commission	Richmond	Three	Appointed	Six	4,000[5]	.....
Washington	The Public Service Commission of Washington	Olympia	Three	Appointed	Six	5,000	20,000
Wisconsin	Railroad Commission of Wisconsin	Madison	Three	Appointed	Six	5,000	.....

[1]Salary of chairman, president or chief commissioner. [2]Salary of second associate commissioner. [3]Salary of first associate commissioner. [4]Salary of commissioner who is clerk. [5]Minimum authorized by constitution.

gage in another business or to hold another political office; time, place and manner of holding sessions, investigations and hearings; office hours and attendance of members; records and procedure; equipment, facilities and expenses required to be furnished commission; provision of funds for commission; secretary or clerk of commission; attorney of commission; employees of commission.

The pamphlet contains the information compiled for each of these subjects and grouped under the names of the different states and of the United States, as well as the tentative table published on page 885.

According to the table the New York public service commissioners are the best paid in the country. They receive $15,000 per year each. South Dakota commissioners receive least of all, their salaries being $1,500 a year. Members of the other forty-five state commissions and one federal commission receive between $1,900 and $10,000 per year. These commissions have in the aggregate no less than 156 members.

The membership of all the commissions with the exception of five is three. The Interstate Commerce Commission has seven members and the California, the Georgia and the two New York commissions have five members each. In the case of twenty-six of the commissions the members are appointed. On the remaining twenty-three they are elected. The terms of office range from two to seven years. The members of twenty-eight of the commissions hold office for six years, of three for five years, of six for four years, of seven for three years and of three for two years. The members of the Interstate Commerce Commission hold office for seven years.

Stringent rules govern the relations of members and employees of commissions with public utilities. In many cases the holding of an interest in any such utility is a disqualification for membership. A commissioner usually is debarred from accepting any gift, gratuity, emolument or employment from any railroad or other public utility, except in some cases passes for use when engaged on official business. In many jurisdictions members or employees, or both, are authorized to pass free on railroads while in performance of their duties.

In twenty-eight jurisdictions no member, officer or employee of the commission is allowed to engage in any other business, employment or vocation or hold any other political office. The statutes sometimes provide that members shall devote all of their time to the duties of their office and in other cases that they shall devote as much time as may be necessary. Several of the states provide for the assessment of the costs of conducting the commissions on the utilities which are under the jurisdiction of the commissions. This is usually done on a gross earnings basis.

The director of the investigation, Mr. Gray, says: "In this part of our compilation we have gathered together all of the material found in the statute books relating to the organization and constitution of central commissions. This legislation is voluminous, and its condensation and analysis have entailed a large amount of time and painstaking effort. It has been distributed to friends of the department and other interested persons, subject to final revision at a later date. We expect the compilation and analysis of public utility regulation laws to be extremely valuable to all who may be interested in the regulation by state authority of public utilities in any part of the country. It will be especially valuable to members of legislatures."

FURTHER DATA ON STORAGE BATTERY TRAIN

In addition to the data published in the Electric Railway Journal for Sept. 28, 1912, on the Beach-Edison storage-battery train for the United Railways of Havana, the following tabulated particulars have been made available by the maker, the Federal Storage Battery Car Company, Silver Lake, N. J.:

Dispatcher's Schedule, Wednesday, Sept. 25, 1912.

Left Pennsylvania station, Thirty-third street, New York	3.12 p.m.
Arrived at Long Beach, L. I.	4.07 p.m.
Left Long Beach, L. I.	5.20 p.m.
Arrived at Pennsylvania station, Thirty-third street, New York	6.14 p.m.

Distance, 24.6 miles one way. Grades, 2 per cent. for 2 miles.

Ampere hours per round trip for three car train	622
Average voltage	224
Train miles round trips	49.2
Number of assengers	136
Net weight with load	68.2 tons
Net weight without load	58 tons
Car miles	147.6
Maximum running speed	42 m.p.h.
Schedule speed	27.14 m.p.h.
Number of stops	3
Acceleration, 1.5 ft. per second	1.02 m.p.h.p.s
Friction on level	13.9 lb. per ton

Energy Consumption.
(Readings on train—battery output—motors consumed.)

	Kw.-hr.
Three-car train, round trip, 49.2 miles	136.800
Per train mile	2.700
Per car mile	0.926
Per ton mile	0.040

Mileage Capacity of Train.
(On this road, with this load, at this speed.)

Note.—An "overcharge" of battery, 10 hours at 20 amp., 60 amp. A "normal" charge of battery, 7 hours at 45 amp.

Intermediate charges may be given battery without undue heating as follows:

"Boosts" 5 minutes at five times normal rate at 225 amp.
"Boosts" 20 minutes at four times normal rate at 180 amp.
"Boosts" 30 minutes at three times normal rate at 135 amp.
"Boosts" 60 minutes at two times normal rate at 90 amp.

	Miles.
On one overcharge of battery	74.2
On one normal charge of battery	65.2
On one normal charge of battery plus intermediate charges aggregating one hour	83.8
On one normal charge of battery plus intermediate charges aggregating two hours	104.4
On one normal charge of battery plus intermediate charges aggregating three hours	121.0
On one normal charge of battery plus intermediate charges aggregating four hours	139.6
On one normal charge of battery plus intermediate charges aggregating five hours	158.2

Motors rated at 37.5 amp, 200 volts, 800 r. p. m., guaranteed overload capacity, 100 per cent.

Batteries rated at 225 amp-hours output (one normal charge), guaranteed overload capacity 500 per cent. charge or discharge.

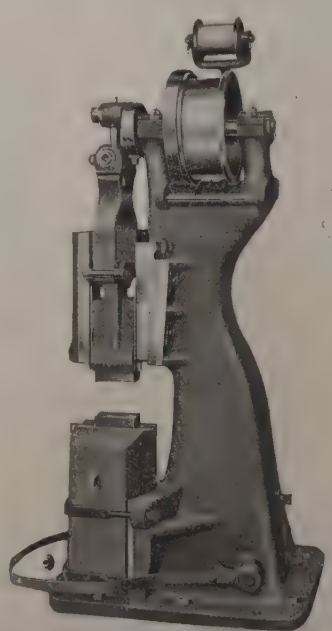
Batteries rated at 302 watt-hours output per cell (one normal charge), 60.4 kw.-hr. per car, 180,200 kw.-hr. per train.

Batteries rated at 342 watt-hours output per cell (one overcharge), 68.4 kw.hr. per car, 225,200 kw.-hr. per train.

	Lb.
Weight of car without battery	34,100
Weight of battery per car	4,600
Weight of car with battery	38,700
Number of battery cells per car for power	200
Number of battery cells per car for lighting and operating solenoids multiple-control relays	20

IMPROVED POWER HAMMER

Beaudry & Company, Inc., Boston, Mass., have recently brought out an improved design of power hammer known as the "Peerless," which is shown in the accompanying cut. This hammer is built in sizes from 25-lb. to 200-lb. weight of ram, and while used for general forging it is especially adapted for plating and drawing steel, for edge tools and for any forgings which require extreme quickness of blows.



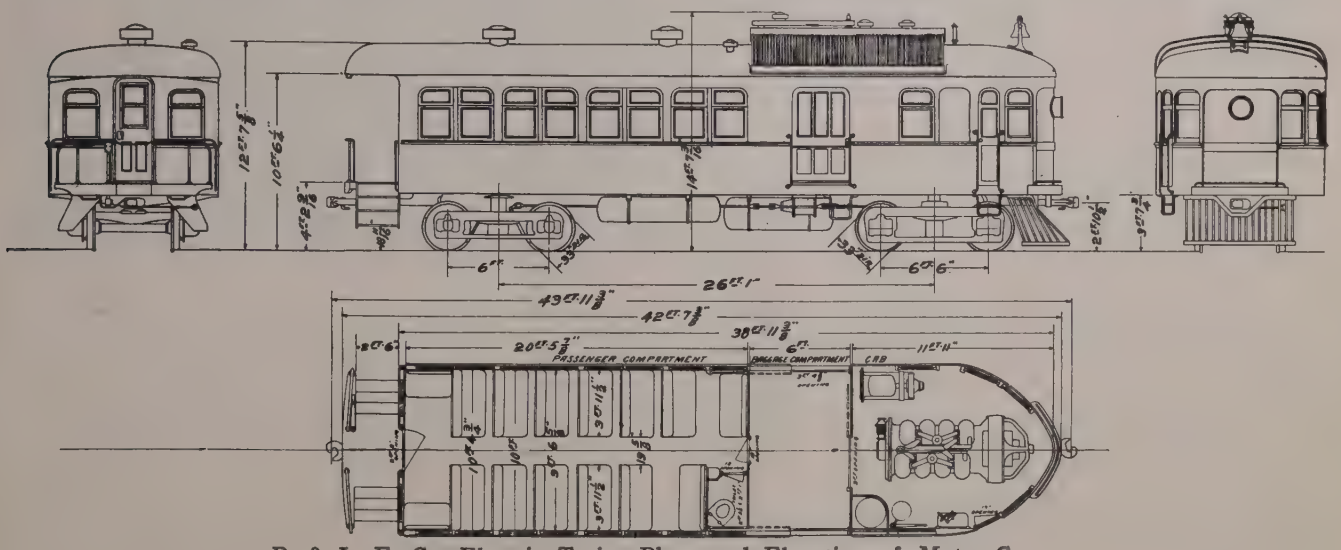
Power Hammer

This hammer has no beam, leather strap, coil springs or rubber cushions, its every working part being of steel. The ram is a steel casting and is connected with spring arms by means of long links arranged to occupy the least possible space, giving at the same time a maximum lift of ram and imparting through the spring arms an elastic and powerful blow. The tension on spring arms and links is adjustable by means of tension nuts. The ram is adjustable on its connecting rod for varying thicknesses of stock. The heavy ram guides are cast solid with the frame and have an adjust-

able taper gib for taking up wear on the guides or ram. The crank pin has a bronze bearing and is adjustable for varying length of stroke. The treadle, working in connection with the belt tightening pulley and friction band brake, instantly starts or stops the hammer and gives the operator perfect control of both speed and force of blow. The frame is cast in one piece and occupies small floor space. The anvil is a separate casting flanged at the bottom for bolts. A wood filler is used between anvil and frame to eliminate vibration. The anvil is also secured to frame by strap bolts, and its position is such that long bars can be worked either way of the dies. The anvil has an independent adjustable shoe die.

GAS-ELECTRIC TRAIN FOR PITTSBURGH SUBURBAN SERVICE

The Pittsburgh & Lake Erie Railroad is about to introduce a significant innovation in connection with local passenger service in the vicinity of Pittsburgh. A contract has been placed with the General Electric Company for a gas-electric car and trailer to form a single train, and it is about to be put in service on the regular accommodation schedules of the railway. The purpose in testing the new system of local transportation on this road is to supplement the steam trains by a service that will afford more rapid interurban transit, with more frequent and convenient stops, and will provide a cleaner and more pleasant means of travel.



P. & L. E. Gas-Electric Train—Plans and Elevation of Motor Car

P. & L. E. Gas-Electric Train—Side View of Motor Car

This application of the gas-electric car is unique because it represents the first instance where a self-propelled car of the gas-electric type will be employed in this country on a main-line, four-track road for local runs, interpolated between the schedules of limited trains. The initial movement is significant of the tendency toward quicker service on local sections of roads in the vicinity of Pittsburgh and may mark the beginning of the adoption of gas-electric cars for such service on other lines. With the greater density of traffic which is bound to result, it is not too sanguine also to predict that the step may ultimately lead to the electrification of local sections of railroad systems entering the city.

The first gas-electric train will probably be placed in service on some short interurban run, and after the train has been introduced advantageously it is contemplated to extend the new service over an initial territory included in the sections of the road lying between Glassport, 2 miles from McKeesport and 17 miles above Pittsburgh, to College, half a mile west of Beaver Falls and 32 miles from Pittsburgh. Above Pittsburgh the gas-electric trains will run over a double-track road and below that point over the main four-track roadbed of the Pittsburgh & Lake Erie system. Some idea of the rapid service which the gas-electric car affords may be gained from the schedule arranged for the trip. This requires that the run from Glassport through Pittsburgh to College, a distance of 49 miles, is to be covered in two hours and thirty minutes, the train making forty-five stops en route.

The gas-electric car for this road is designed essentially for operation with a trailer, and while the motor car itself is smaller than the standard sizes heretofore developed, the seating capacity of the combination is greater and equals the best ruling practice of interurban roads. The car body is of the J. G. Brill Company manufacture. It is of all-steel construction, except for the interior finish, has the same motive power equipment, and in point of construction conforms in other respects to the 70-ft. gas-electric cars built by the General Electric Company. It is 42½ ft. long, 10 ft. 5 in. wide and weighs 36 tons. The company contemplates seating three passengers on each of the cross-seats, which are 3 ft. 11½ in. wide; the car has therefore a capacity for forty-two people. The car is partitioned into three compartments—one 20 ft. 5 in. long for passengers, which has seats finished in genuine Spanish leather and is designed for a smoking compartment; a small section for baggage 6 ft. long, as the traffic requirements in this case do not call for the transportation of bulky express, and a cab 12 ft. long containing the power plant apparatus. A rear platform entrance is provided. The trailer is 45 ft. long, weighs 22 tons and seats eighty people, based on three

passengers on each main cross seat. The seats are cushioned with friezette plush. The interior trim is of mahogany, and the car deck is ceiled with composite board. The trailer has front and rear platform entrances.

The gas-electric type of car was selected for the service because it afforded a flexibility of operation through the application of electric transmission to the internal-combustion engine motive power that could not be secured otherwise. Smooth and rapid acceleration is obtained by varying the strength of the generator field, without rheostatic power losses or gear changes. In the new P. & L. E. motor car the two GE-205, 600-volt motors of 100 hp each, which are of the commutating-pole type, are also governed by shunt field control. Two extra points are provided on the controller for final speed acceleration in parallel, whereby the motor fields are shunted and weakened. The resulting higher armature speeds permit smaller pinions, and full utilization of the power input is secured throughout the entire speed range.

A POWER-DRIVEN CAR CLEANER

At the meeting of the Keystone Railway Club held at Scranton, Pa., Sept. 10, and reported in the Electric Railway Journal for Sept. 14, one of the speakers mentioned that the Jersey City shops of the Hudson & Manhattan Railroad, New York, were using a motor-driven machine for cleaning the sides of steel cars. Detailed particulars of this method of car cleaning and data on the cost of labor and material have now been furnished by P. V. See, superintendent car equipment of this company.

The present device consists of a Chicago Pneumatic Company electric drill to which a circular brush is attached, the whole being operated noiselessly through speed-reduction gearing at 1350 r.p.m. by a 110-volt, 25-cycle motor. The original drive was pneumatic, but this was found to be too noisy and inconvenient on account of the dragging hose. It was also rather expensive in maintenance and air consumption. In fact, the cost of energy for air consumption was about 50 cents a day compared with 2 cents a day for straight electric drive. The brush is of the ordinary round window-cleaning type used for manual car cleaning with a bristle holder of about 5½-in. diameter, but the original bristles are replaced by stiffer ones. One brush will serve to clean the exteriors of about twelve 48-ft. all-steel cars. After this the brushes are still used by the men to spread the emulsion by hand before it is worked up by means of the machine. The brush is not operated at the high speed hereinbefore noted because when pressure is applied to the brush its speed is greatly reduced. The entire mechanism weighs only 6¼ lb., and as the trailing wire is very light a workman can use it steadily all day long without feeling any undue fatigue. The revolving brush has been found especially effective in working around rivets.

This brush is used in connection with the S. & S. car cleaner as follows: First, one of the two men per car spreads the material by hand over various parts of the exterior with a worn brush; then the revolving brush is used for the cleaning and polishing; next the sides are wiped down with dry waste, and finally the outside panes of the windows are cleaned. The motor and emulsion were furnished by the Sanitation & Supply Company, New York.

The method of paying for cleaning car exteriors in this way is also of interest. Two men always work together, taking turns in handling the motor brush. The reason for including outside window cleaning by the same men is to make them exercise more care in preventing the spattering of the emulsion. This policy has eliminated complaints from the regular window cleaners, who had asserted that their work was ruined by the carelessness of the emulsion users. With the aid of the electrically operated brush two men clean the exteriors of three cars in an eight-hour day, at an average labor cost of $1.07 per car, compared with a cost of $1.75 when the work was done by hand at the rate of two cars a day with a two-man gang. This payment is based on the bonus rate system which is used in these shops for all work except the straight window cleaning, which is on a piece-work basis. The bonus rate for this operation is $1.20 per car. The hour rate of each of the two men is 17½ cents, so that the labor cost of turning out the three cars in eight hours is $2.80. At the bonus rate of $1.20 per car, however, this cost would be $3.60. The company therefore divides evenly with the men the difference between $3.60 and $2.80, so that each cleaner earns 20 cents extra a day. The cost of the material averages about 50¾ cents per car, based upon the use of 1⅓ lb. of waste

Motor-Driven Car-Cleaning Brush

and ⅔ gal. of the emulsion. Motor-brush cleaning is done once a month. In addition, however, arrangements are made to dry-wipe the cars twice a month in view of the tendency of the emulsion to catch particles of dust. The dry-wiping is done by two men who go over the cars at the terminals. Such cleaning takes about half an hour and costs about 30 cents per car.

MERCURY VAPOR LAMPS AT SYRACUSE CARHOUSE

The Syracuse (N. Y.) Rapid Transit Railway has been using mercury vapor illumination in one of its carhouses since the spring of 1909 with entire satisfaction. J. P. Barnes, chief engineer of the company, states that during the first six months the lamps were on the 550-volt circuit supplied by the local lighting company because it was thought that constant voltage was necessary for the satisfactory operation of this type of lamp. Since that time, however, the company has been operating the lamps off the regular trolley circuit with very little, if any, increase in the cost of maintenance. The units are 300-cp type H Cooper Hewitt lamps arranged nine in series on a trolley circuit which averages a little more than 500 volts. In all, twenty-seven lamps of this capacity are used to serve a total floor area of about 23,000 sq. ft. The general illumination from these lamps is excellent and, in fact, much better than the company had been able to secure from the expenditure of an equivalent amount of energy by the use of incandescent lamps. For pit work the company still uses incandescent lamps with extensions which enable the workman to get the light close to his work for inspection purposes; furthermore, the lamps inside the cars are used for illumination while the car is being swept and cleaned. For all other purposes such as outside car work, car shifting, etc., the mercury vapor lamps are used exclusively.

News of Electric Railways

Michigan Supreme Court Affirms Decision of Wayne County Circuit Court in Detroit Franchise Case

The Supreme Court of Michigan has handed down a decision in the case of the city of Detroit against the Detroit (Mich.) United Railway, involving the right of the company to continue to operate on Fort Street after its franchise has expired and the power of the city to eject the company by force from the street. The court declares that the right of the company to occupy the street expired with the expiration of the franchise under which it operated and that it is trespassing in continuing to run its cars. On the other hand, the court holds that the city has no authority to fix arbitrarily a rate of rental for the use of the street, nor has it the right to remove the property of the company by force. The decision was written by Justice McAlvay and concurred in by other members of the court.

The case arose from the steps taken by the city to collect a rental of $200 a day for the use of the street since the expiration of the franchise. The company contended that the rental was excessive and exceeded the earnings of the line. In 1905 the City Council passed an ordinance seeking to give the municipality the right to control the operation of the cars and making the company subject to such resolutions as the body might pass. The company applied to the federal court for an injunction to prevent the publication of this ordinance and the case is still pending. Before the franchise expired the City Council passed three ordinances fixing the rental at $200 per day and declaring that the rights of the company in the street had expired. The suit followed.

In concluding its decisions, the court said:

"The conclusion to be drawn from our determination of the different propositions presented is that the contractual relations between these parties ended upon the expiration of the franchises and that all rights in the defendant company to occupy the city streets and maintain and operate a street railway thereon then terminated, and the defendant therefore becomes a trespasser; that complainant has the absolute and unquestioned right at any time to compel the defendant company to vacate the streets upon which these franchises have expired and to require it to remove its property therefrom within a reasonable time, and, if necessary for that purpose, to enforce its rights by a writ of assistance from this court.

"From this determination it does not follow that any rights of ownership in and to its property in the public streets used in the maintenance and operation of its railway are taken from it. On the contrary, it is settled law that after the expiration of a franchise of a street railway such property belongs to it. Such ownership carries with it the right of removal and no arbitrary power is given to the complainant, or should be given to it, to proceed at once by force to effect such removal. Defendant is entitled to and should have notice to remove its property within a reasonable time.

"In the disposition of the questions involved we agree with the trial court except in two matters:

"1. We have not declared that defendant has created a nuisance in the streets in question because we do not think such to be the logical conclusion to be drawn from the opinion. We hold that the defendant is committing a continuing trespass, which entitles the complainant to the relief indicated.

"2. We have determined that complainant could not arbitrarily fix a rate for the use of the streets by a defendant, from which conclusion it follows that this court cannot assume such power.

"A decree will be prepared and presented to this court conforming with the conclusions of this opinion, providing for injunctive and other writs necessary to carry it into effect, and the cause will be remanded for further proceedings. Complainant will recover the costs of both courts."

Mayor Thompson has sent a communication to Corporation Counsel Lawson directing him to proceed with the collection of the rent now due on the Fort Street line, which is about $160,000. His letter follows:

"The case of the city of Detroit against the Detroit United Railway having been affirmed by the Supreme Court and the rights of the city to the possession of Fort Street having been established by the decision, I desire at this time to direct you and Mr. Lucking, your associate, to cause a decree to be entered in which all of the fruits of the litigation will be available to the city.

"The $200 a day might be argued to be somewhat high for the use of that particular street, but when we consider that nearly 80 miles of the streets are now being used by the company upon the payment of the meager sum of $300 a day, $100 cannot be said in all fairness to be excessive. If we allow the company a fair return upon its investment, that is all it should expect.

"The gross income of the company on the city lines within the one-fare zone is more than $17,000 a day. The company is now making upward of $2,000,000 per year net operating revenue over and above all expenses and taxes. If we were to allow it 6 per cent upon a valuation of $15,000,000—which is, according to all the information I can get, an exceedingly high valuation—that would be $900,000, leaving a net profit of $1,100.000 per year. To say that a charge of $185,000 per year would be unreasonable under such circumstances is absurd.

"These resolutions of the Common Council call for only $182,500 per year. In my opinion this is most moderate and reasonable. I expect you so to conclude this litigation that the company must either pay all the rental from the date of the expiration of the franchise up to the present time and continue to pay it until further action by the city, or be ejected from the street.

"I have given this matter most mature and deliberate consideration, and it is clear that this rental charge is reasonable and the company must pay it or get out."

On Oct. 8 Corporation Counsel Lawson, at the request of Mayor Thompson, served upon the attorneys for the Detroit United Railway a copy of the decree which he proposed to ask the Michigan Supreme Court to enter in the Fort Street rental case. Mr. Lawson informed the attorneys that the decree would be presented to the court on Oct. 12. It is concluded as follows:

"That by reason of said defendant's refusal to comply with the terms of the resolutions of the Common Council of Detroit, it, the defendant, is without any rights in or to said streets, and it is a trespasser in continuing to occupy them and operate cars thereon.

"That the defendant, the Detroit United Railway, is hereby restrained and enjoined from operating street cars upon said streets after the expiration of ten days from the date of this decree unless it obtains permission and consent from the complainant to do otherwise, and that a writ of injunction issue as above.

"That the defendant, the Detroit United Railway, is hereby given thirty days from the date of this decree in which to remove its tracks and other railway equipment from said streets unless it obtains permission and consent from the complainant to do otherwise, and in default of said removal the writ of assistance do issue as above provided. It is further ordered that in removing its tracks and other personalty the defendant is enjoined from removing the pavement in said streets and from disturbing the same any more than is absolutely necessary for said purpose, and that it promptly restore the pavement in fit condition for public travel, under the supervision and to the satisfaction of the department of public works of the city of Detroit; and it is also ordered and decreed that in the work of said removal it, the defendant, leave sufficient space in either side of the street to accommodate public travel at all hours.

"It is further decreed that the said complainant shall recover its costs of both courts in this suit to be taxed against said defendant and that it have execution therefor."

In addition to the proposed ouster suit, included in the above decree, the city has pending cases in which it asks that the company be enjoined from collecting two fares from passengers on lines that cross the city limits into Fairview and from collecting 2 cents each for transfers from the 3-cent to the 5-cent lines.

The Wayne County Circuit Court will be asked to set an

early date for hearing the transfer case, which was begun last March. The company contends that it is not required to give a transfer free for any fare less than 5 cents. On the other hand, the city claims that free transfers are required by the franchise granted to the 3-cent lines.

The case bearing upon the collection of two fares from passengers who ride to the new city limits was decided against the company by the Wayne County Circuit Court and appealed to the Supreme Court. Mr. Lawson proposes to have this case called up as soon as possible and he will ask for an early decision. The company had always carried passengers to the old city limits at St. Jean Street and collected another fare to Alter Road, the new limits. The city contends that the company is bound by ordinance to carry passengers to the city limits, no matter where they may be or whether extended or not, for a single fare.

Suit has been entered against the company in the Wayne County Circuit Court for the collection of $268,000 in taxes, with interest and costs which will amount to $432,000. These are taxes for 1910, 1911 and 1912 that it is alleged the company declines to pay on the ground that the $300-a-day tax for the use of the streets is in lieu of all other taxes.

Judge Carter's Reasons for Acting as Third Arbitrator at Chicago

Judge Orrin M. Carter of the Supreme Court of Illinois, who has consented to act as the third member of the board of arbitration which is to consider the differences between the surface railways of Chicago and their employees, has issued a letter in part as follows:

"In deciding to act as arbitrator I have been compelled to keep in mind my duties as a member of the Supreme Court. Delay in deciding cases often amounts to a denial of justice. Every member of this court is desirous of keeping abreast of its work. To do this requires the active and continual co-operation of every judge. At the opening of this October term we were fortunate in having every opinion written in every case at issue. The work of this term, however, is greater than at any term since my connection with the court. While in session at Springfield it is impossible for the work to proceed satisfactorily if any judge is absent. Moreover, for me to act on an arbitration board, even when the court is not in session, means that my share of the work must be left untouched while I am giving attention to arbitration matters.

"Doubtless some will think that it is improper for a judge of a court of last resort to serve on a board of arbitration. But by his election as judge a man does not cease to be a citizen. The duties of citizenship may require of him a public service not strictly judicial. I believe this is a service of that character.

"You have all repeatedly insisted that it is practically impossible at the present time to agree upon any other man as third arbitrator. In view of the peculiar and extraordinary situation that seems to have arisen, I have reluctantly reached the conclusion that I should accept this appointment. In accordance with your suggestion at our last conference, as soon as the October term of the Supreme Court adjourns I will return to Chicago and meet with the other two arbitrators for the purpose of arranging for the hearing of this matter."

George E. Hamilton on Street Railway Affairs in Washington

George E. Hamilton, president of the Capital Traction Company, Washington, D. C., was quoted recently at considerable length by the Washington *Star* in regard to street railway matters in Washington and the Maryland-Virginia Company, the proposed holding company for the Washington Railway & Electric Company and other companies. His remarks are reported in part as follows:

"No definite proposal of a merger was ever made to the Capital Traction Company by representatives of the Washington Railway & Electric Company, or considered by its directors. In personal conversations between myself and one of the directors of the Washington Railway & Electric Company in 1911 the desirability of having the roads under one management was several times informally discussed, and at the last conversation the statement was made by me that I would not recommend any merger on a stock basis and did not think that the Capital Traction Company would consider any such proposition. The director of the Washington Railway & Electric Company referred to said that a sale of the stock of his company would not be considered for a moment by the men who held the controlling interest, and there the discussion ended, and it has never been reopened.

"Personally I do not favor a grouping of the public utilities of Washington in any holding company, but if such a unification could be accomplished under an arrangement that would give full, fair and equal protection to all stockholders alike, would safeguard the public and would meet the approval of Congress, or a public utility commission created by Congress, I can see in it certain advantages both to the traction interest and to the public. The Capital Traction Company, however, is content to go along under its present charter, endeavoring to meet the reasonable demands of the public.

"I am not opposed to the creation of a public utility commission, and I think that the Commissioners of the District of Columbia should constitute that commission. As governors of the District the commissioners have already, and necessarily, some control over the electric railways. They are men of standing, ability and integrity. Because of its stability and of the high standing of its members, I first preferred and urged that the control of the street railways should be placed with the Interstate Commerce Commission. I am convinced, however, that the Interstate Commerce Commission is too crowded with larger and more important works and that it does not desire to continue in control. With the companies under the jurisdiction of a utilities commission many situations and difficulties could be judiciously and expeditiously determined and acted upon which are difficult and tedious to solve when Congress has to be applied to. Again, the commission, especially, if the Commissioners of the District of Columbia constitute that commission, would know, or more readily and certainly learn, the needs of both the public and the companies; would be in closer touch and more useful in every way than Congress or the committees of Congress, which are constantly changing, and whose members come as strangers to Washington, unacquainted with its needs and still more unacquainted with the operation of the public utilities."

City Club Favors Elevated Marginal Railway on West Side of New York

A special committee appointed by the City Club of New York to consider the plans which have been proposed for displacing the surface steam railway tracks on the West Side of Manhattan and for providing a freight terminal has reported in favor of an elevated marginal freight railway. This report has been submitted by the City Club to the Board of Estimate and Apportionment, which has the matter under consideration. In its conclusions the City Club agrees with the Merchants' Association in favor of a comprehensive freight terminal for the West Side of Manhattan. In its report the committee says:

"We are unanimous that the improvement should be a marginal railway extending from Sixtieth Street to Cortlandt Street or below. We have not failed to consider the advantages claimed for the unit terminal system, as reported to the Board of Estimate and Apportionment by its engineers; but we are of the opinion that that system would not afford a solution of the problems before us in the following important respects:

"It does not appear that the railways for whose use unit terminals are proposed are willing to avail themselves of the same. On the contrary, we are informed that all condemn the plan. While such a plan might, if availed of, afford some relief from the excessive use of North River piers for railway purposes, the relief would not be very great, since entire piers would be necessary for the operating ramps by which cars would be carried over the marginal street to the unit terminals.

"No railway would be likely to invest heavily in a permanent terminal to the east of the marginal way, unless

granted permanent rights, or at least for a very long period, in the pier connected therewith. To grant such would be bad policy.

"This plan affords no solution of the Eleventh Avenue problem. It might be that the New York Central & Hudson River Railroad would, for a consideration arrived at by agreement with the city, discontinue its tracks south of Thirtieth Street. This seems unlikely, however, since unit terminals for other roads would afford greater occasion for its maintaining its freight station at St. John's Park. Above Thirtieth Street the company could be compelled to put its tracks underground, thus continuing Thirtieth Street as its great freight terminal. That alone would do little, however, for the distribution of freight, and would merely create greater congestion in that neighborhood. These things, also, could not be accomplished at one and the same time, unless the New York Central & Hudson River Railroad and other railways would co-operate with the city government in bringing it about.

"The unit terminal plan suggested would merely transfer the inconveniences of trucking on the broad marginal street to one of the narrower streets east of West Street. Such unit terminals as are desirable can be established under the marginal railroad plan, and can be served to much better advantage, in the opinion of your committee, than were the system adopted which is recommended by the engineers of the Board of Estimate and Apportionment."

The committee summarizes the arguments in favor of the marginal railway as follows:

"This plan unequivocally calls for the removal of the tracks of the New York Central & Hudson River Railroad from the surface of Eleventh and Twelfth Avenues, in exchange for a franchise upon the new marginal railway, or such other privileges and franchises as may be granted.

"This plan involves arrangements for a larger number of tracks north of Sixtieth Street, to be covered along Riverside Park, and the establishment of such conveniences for freight and passenger distribution along the shore of Manhattan Island and up the Hudson River as will greatly benefit not merely the sections immediately affected, but also the entire city.

"This plan also must involve the right of other railways to use these tracks upon proper terms for the receipt and distribution of freight. Such as choose could establish ramps to this elevated structure at least as easily as ramps across West Street into unit terminals. The advantages to a railway and the public of making such connections with the marginal railway are, in our opinion, much greater than those of the unit terminal system.

"In case such a marginal railway were constructed, the ultimate solution of the receipt and distribution of freight by railways terminating in New Jersey would be through a tunnel under the North River and the establishment of freight classification yards in common on the Jersey meadows. Estimates of the cost of such a tunnel and of such yards and for the operation of the same after so constructed and established have been shown us. We are of the opinion that freight could be delivered and distributed upon Manhattan Island and also could be received there and be taken to the Jersey yards and there classified at materially lower expense than under the present system. This economy would, in our opinion, in the near future compel the construction of such a freight tunnel and the establishment of such a system."

The committee says that the cost of building an elevated marginal railway would be about one-third the cost of a subway, and it points out that as much of the ground upon the west side is "made land," subway construction would be especially difficult. Moreover, an elevated railway would permit easy connection with warehouses and piers.

Work of the Wisconsin Board of Arbitration

In a statement in regard to the work of the Industrial Commission of Wisconsin in promoting voluntary settlement of disputes between employers and employees the Bulletin of the Industrial Commission of Wisconsin says in part:

"Since the transfer of the work of the board of arbitration to the Industrial Commission, the former secretary of the board has acted as chief mediator for the commission. The commission itself was called upon to offer its services in the case of the trouble of the street car men in Milwaukee, but its services were declined by the company. Under its power of investigation the commission proceeded to hold a public hearing and to inquire into the conditions of the employees and the facts respecting the grievances which they alleged. The findings of fact were afterward published and will be furnished on application. The commission concluded that an increase of 2 cents an hour in wages for motormen and conductors would be a reasonable advance. The commission has no authority whatever to enforce its findings of this character, the express provision of the law limiting its authority to that of promoting voluntary settlements. Following the publication of the findings of the board, the company advanced the wages of motormen and conductors 1 cent per hour, except for new men beginning work after the time when the advance took place, and some other conditions were improved. In addition to this strike, the chief mediator has investigated other strikes. In no case, however, was an agreement brought about between employers and employees."

Portland Straphangers Ordinance to Be Repealed

Ten councilmen of Portland, Ore., have signed a call for a special meeting of the City Council of Portland for the avowed purpose of repealing the recently enacted ordinance providing that passengers of the Portland Railway, Light & Power Company who were not furnished with seats should pay but 3 cents fare. The ordinance has been pronounced by the Portland Railway, Light & Power Company to be physically impossible of enforcement. When the day arrived for the enforcement of the ordinance the representatives of the company obtained a restraining order from the federal court to prevent its enforcement, pending arguments for a permanent injunction, which are now in progress. Reference has been made previously in the Electric Railway Journal to the progress of the ordinance before the Council and to the provisions of the measure. The following provision in particular was held by the company to be unreasonable and impracticable:

"There shall be placed above the entrance of every street car in large letters words and figures indicating the seating capacity of the car, and when the conductor shall have rung up the number of fares equal to the capacity of the car, all other passengers carried shall be charged 3 cents, and if the number of passengers in the car falls below its seating capacity any person standing and who may have paid the 3-cent fare may take a seat vacated by other passengers without any extra charge."

Report on Interurban Terminals at Cincinnati.—Bion J. Arnold's report on the question of rapid transit entrance and terminals for the interurban railways at Cincinnati, made at the request of the Interurban Rapid Transit Commission of Cincinnati, has been completed and will be delivered to that body shortly. It is said that Mr. Arnold will recommend the use of the canal bed for a four-track way for roads that can reach it and the use of the old Cincinnati & Westwood line for the entrance of the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad. The terminal is to be located on the proposed canal boulevard.

First Fall Meeting of Employees at Hamilton.—The first monthly meeting of the season of the employees of the Dominion Power & Transmission Company, Ltd., Hamilton, Ont., was held in their rooms at the Terminal Station on Oct. 2. Edward P. Coleman, the manager of railways of the company, discussed the subject "The Early Days of Electric Power and the Railway Business." He explained the many difficulties that confronted companies during that period and told a number of anecdotes which amused the audience. An impromptu mock trial was a feature of the entertainment.

Duluth Street Railway Strike.—The Duluth (Minn.) Street Railway is maintaining service on all its lines. On Sept. 30 the City Council adopted three resolutions affecting the company. They provide briefly that motormen pass tests and secure licenses from the city before moving cars, that a committee of the Council be appointed to settle the strike

by arbitration and that the city attorney start action to collect a fee of $10 for each car operated locally in West Duluth, under the ordinance requirement passed by the West Duluth Council in 1891. On Oct. 2 strike sympathizers ditched four cars. None of the passengers was injured. Rioting occurred on Oct. 6 in the west end manufacturing district, where cars were stoned and several passengers were injured.

Chemical Laboratory for Illinois Traction System.—The department of operating engineers of the Illinois Traction System has been expanded to include a chemical department, which will analyze all coals, oils, waters and other materials used at all of the properties of the McKinley System. A chemical laboratory has been equipped in Peoria. When the work of this new department grows to larger proportions the laboratory will probably be moved to the general repair shops at Decatur, where most of the supplies for the system are stored. N. R. Beagle, a graduate in chemistry at Cornell University, has been added to the operating engineering force and will have charge of the laboratory and the analyses.

Another Subway Proposal in Pittsburgh.—At a meeting of the Council of Pittsburgh, Pa., on Oct. 14, 1912, a subway offer was received from the City Rapid Transit Company. This company has offered to give the city a percentage of its net proceeds in return for the privilege which it seeks. John C. Waite, New York, N. Y., representing the company, said that the Belmonts were interested in the company. The entire matter, with the previous proposals of the Pittsburgh Subway Company and the United Terminal Company, was referred to Assistant City Solicitor Charles K. Robinson, who has been instructed to report on the legal phases of the cases and to say which plan, in his estimation, would be best for the public.

New Rules in Regard to Traffic on the British Columbia Electric Railway.—A number of changes in the methods of operation on the British Columbia Electric Railway, Vancouver, B. C., have been ordered by the Attorney General. The number of passengers to be carried on interurban cars between Vancouver and Chilliwack and New Westminster will be limited to the seating capacity of the cars. On interurban cars the company will be required to provide a separate compartment for mail and baggage. No more single-truck cars are to be ordered by the company and city cars are to be equipped with platform doors or gates. When the car is full the gate is to be closed and a notice "Car Full" posted in a conspicuous place. A car is to be considered full when all the seats are occupied and there is one additional passenger to each 4 sq. ft. of standing room. Each car is to display prominently a notice giving its carrying capacity. The company will not be permitted to put on any new cars without having them approved by the inspector. The height of the bottom step of the car is not to be more than 16 in. from the ground. All cars now in use are to be changed, if necessary, to conform to this rule. No person is to be allowed to operate cars or trains without passing an examination covering the company's rules and an eye and ear test. The company is to have until the end of the present year to comply with the new requirements.

ASSOCIATION MEETINGS

American Electric Railway Association

The mid-year meeting of the American Electric Railway Association will be held in New York Jan. 29, 30 and 31, 1913. It will be held at the headquarters of the association, 29 West Thirty-ninth Street.

New England Street Railway Club

The regular meeting of the New England Street Railway Club will be held on Oct. 23, 1912, at the Boston City Club, Beacon and Somerset Streets, Boston. Dinner will be served at 6.30 p. m., and the regular meeting will be held at 8, at which time the Rev. Dr. Thomas Chalmers of Manchester, N. H., will deliver an address: "The American Type of Business Enterprise."

Financial and Corporate

Stock and Money Markets

Oct. 16, 1912.

On the morning of Oct. 15, 1912, there was a considerable advance in the prices of securities traded in on the New York Stock Exchange, but in the afternoon prices receded sharply. A quiet but strong market followed to-day. London became a buyer of stocks here, and this had its effect on exchange rates. This purchasing, of course, was on a small scale compared with the volume of recent foreign sales. Rates in the money market to-day were: Call, 3@5 per cent; sixty days, 5 per cent; four months, 5½@5¾ per cent; five and six months, 5¼@5½ per cent.

In the Philadelphia market to-day there was considerable interest in the traction issues. The sale of Philadelphia Rapid Transit certificates totaled 1845. The demand for bonds was fair.

The market for stocks in Chicago to-day was narrow. Chicago Railways series 2's led with total sales of 1365. The demand for bonds was good. Sales were recorded of $20,000 of Chicago Railways 5's at par.

In the Boston market to-day the railroad issues were dealt in sparingly. The market for bonds was dull.

The Baltimore market was dull and narrow. An important transaction was the sale of $10,000 of the 5 per cent bonds of the Fairmont & Clarksburg Traction Company.

Quotations of traction and manufacturing securities as compared with last week follow:

	Oct. 9.	Oct. 16.
American Brake Shoe & Foundry (common)	a99½	a97¾
American Brake Shoe & Foundry (preferred)	...	155
American Cities Company (common)	33¾	a31⅞
American Cities Company (preferred)	77	a77¾
American Light & Traction Company (common)	a450	a436
American Light & Traction Company (preferred)	a113	a110½
American Railways Company	a43¼	a44
Aurora, Elgin & Chicago Railroad (common)	a46	a46
Aurora, Elgin & Chicago Railroad (preferred)	a88½	a88
Boston Elevated Railway	a121	123
Boston Suburban Electric Companies (common)	a15	a15
Boston Suburban Electric Companies (preferred)	a78	a78
Boston & Worcester Electric Companies (common)	*10	*10
Boston & Worcester Electric Companies (preferred)	a50	a50
Brooklyn Rapid Transit Company	90¾	91
Capital Traction Company, Washington	a124½	a124
Chicago City Railway	*170	a170
Chicago Elevated Railways (common)	*35	a32
Chicago Elevated Railways (preferred)	*92	a92
Chicago Railways, ptcptg., ctf. 1	*90	a90
Chicago Railways, ptcptg., ctf. 2	*24½	a26
Chicago Railways, ptcptg., ctf. 3	*8½	a9¼
Chicago Railways, ptcptg., ctf. 4	*4	a4
Cincinnati Street Railway	a130	a128½
Cleveland Railway	a106	a106
Cleveland, Southwestern & Columbus Ry. (common)	7	a6½
Cleveland, Southwestern & Columbus Ry. (preferred)	34	a35
Columbus Railway & Light Company	a55	a55
Columbus Railway (common)	a70	a70
Columbus Railway (preferred)	a90	a90
Denver & Northwestern Railway	125	a125
Detroit United Railway	70	a70
General Electric Company	183½	182¾
Georgia Railway & Electric Company (common)	a126¾	a126
Georgia Railway & Electric Company (preferred)	a85¼	a85
Interborough Metropolitan Company (common)	21¼	21⅜
Interborough Metropolitan Company (preferred)	64⅞	67
International Traction Co., Buffalo, 4% bonds rcts	75	75
Kansas City Railway & Light Company (common)	22	a24
Kansas City Railway & Light Company (preferred)	42	a40
Lake Shore Electric Railway (common)	8½	a8
Lake Shore Electric Railway (1st preferred)	93	a92
Lake Shore Electric Railway (2d preferred)	28	a28¼
Manhattan Railway	a133⅛	a134
Massachusetts Electric Companies (common)	a20	a20
Massachusetts Electric Companies (preferred)	a79	a79
Milwaukee Electric Railway & Light (preferred)	*102	a102
Norfolk Railway & Light Company	28	a28
North American Company	84⅞	84⅞
Northern Ohio Light & Traction Company (common)	a70	a70
Northern Ohio Light & Traction Company (preferred)	a105	a105
Philadelphia Company, Pittsburgh (common)	a51⅜	a50¼
Philadelphia Company, Pittsburgh (preferred)	a44½	a44
Philadelphia Rapid Transit Company	a27⅜	a27⅜
Portland Railway, Light & Power Company	66	a66
Public Service Corporation	a120	119
Third Avenue Railway, New York	41¼	40⅝
Toledo Railway & Light Company	a8¾	a7⅞
Twin City Rapid Transit Co., Minneapolis (common)	a108	a106½
Union Traction Company of Indiana (common)	14	a11
Union Traction Company of Indiana (1st preferred)	88	a88
Union Traction Company of Indiana (2d preferred)	40	a42
United Rys. & Electric Company (Baltimore)	...	a25¾
United Rys. Inv. Company (common)	a32½	a32½
United Rys. Inv. Company (preferred)	a62½	62
Virginia Railway & Power Company (common)	*50¼	*50¼
Virginia Railway & Power Company (preferred)	a87½	a87½
Washington Ry. & Electric Company (common)	a92½	a90⅛
Washington Ry. & Electric Company (preferred)	a92	a91¼
West End Street Railway, Boston (common)	a81	a81½
West End Street Railway, Boston (preferred)	a98	97
Westinghouse Elec. & Mfg. Company	84⅞	a85
Westinghouse Elec. & Mfg. Company (1st preferred)	a120	a126

*Last sale. a Asked.

ANNUAL REPORT

New York, New Haven & Hartford Railroad System

The income account of the New York, New Haven & Hartford Railroad System, except the New York, Ontario & Western Railway, the Boston & Maine Railroad and the Maine Central Railroad Company, for the fiscal year ended June 30, 1912, shows the following result:

Revenue:	
Freight	$38,974,456
Passenger	43,932,342
Mail	698,418
Express	3,240,383
Other transportation revenue	825,595
Revenue other than transportation	1,955,855
Electric light	204,417
Electric power	619,055
Gas	175,952
Water	15,432
Total revenue	$90,641,905
Less operating expenses	59,407,632
Net operating revenue	$31,234,273
Net revenue from outside operations	1,383,449
Total net revenue	$32,617,722
Accrued taxes	4,949,095
Operating income	$27,668,627
Income from other sources	4,787,487
Total income	$32,456,114
Deductions from income:	
Rentals of leased roads	$5,062,527
Interest on bonds	3,310,496
Interest on convertible debentures	2,665,307
Interest on debentures	4,627,273
Other interest	1,298,731
Rentals other than above	2,197,014
Miscellaneous	379,263
Total deductions from system's combined earnings	$19,540,611
Total net earnings of N. Y., N. H. & H. R. R., including earnings of subsidiary companies	$12,915,503
Dividends paid N. Y., N. H. & H. R. R. stockholders other than subsidiary companies	12,609,668
Surplus	$305,835

In regard to the work of the electrical department of the company President Mellen says:

"The most important pieces of work that have been under prosecution by the electrical department during the past fiscal year are: The extension of Cos Cob power station; the electrification of Harlem River Branch main line, yards and sidings, and electrification of yards and sidings Woodlawn to Stamford; the electrification of the New York, Westchester & Boston Railway; the extension of electrification from Stamford to New Haven; the elimination of electromagnetic induction on foreign wires in the electric zone.

"April 27, 1911, ground was broken for the extension of the present Cos Cob station, to include four 5000-kva turbo-generators with full complement of steam and auxiliary parts. Current has already been supplied from the terminals of the first generator of the extended plant, and the progress of construction indicates that the remaining sets will be in readiness to supply current by Oct. 1, 1912. This extension of the station completes the power plant, the capacity of which is sufficient to handle all trains—passenger, freight and switching—in the zone of electrification, inclusive of the New York, Westchester & Boston Railway, between New York, Harlem River and New Haven.

"The electrification system of the main line of the Harlem River Branch is completed, and on July 29 electric passenger service was inaugurated between Stamford and Harlem River. The electrification of the yards and side tracks is expected to be completed and electric switcher operation commenced at an early date.

"The electrification of the four-track section of the New York, Westchester & Boston Railway, between 180th Street, New York, and South Mount Vernon, and the two-track section from South Mount Vernon to Larchmont Junction was completed on May 25, 1912, and electric operation inaugurated on May 29. The work of electrification of this road was completed and electric operation inaugurated on Aug. 3.

"The work of electrifying the main-line tracks, Stamford to New Haven, is well under way and is expected to be completed within the next fiscal year.

"A satisfactory method of practically eliminating electromagnetic induction on telegraph and telephone wires has been worked out, and the additional installation necessary on the main line, the Harlem River Branch and the New York, Westchester & Boston Railway will be pushed as rapidly as possible.

"During the year orders have been placed for multiple-unit equipment to the extent of thirteen motor cars and twenty-six trailers for use in the passenger service on the Harlem River branch; three a.c.-d.c. and thirty-six a.c. electric freight engines for freight service between Harlem River and New Haven and fifteen electric switch engines for use in the various electrified yards of the New Haven company.

"The following sections of the New York, Westchester & Boston Railway were opened for commercial service. On May 29, 1912, from Adams Street, borough of the Bronx, New York, to North Avenue, New Rochelle; on July 1, 1912, from Columbus Avenue Junction, Mount Vernon, to Mamaroneck Avenue Station, White Plains; on Aug. 3, 1912, from Adams Street, Bronx, south to the junction with the Harlem River Branch of the New York, New Haven & Hartford Railroad near 174th Street and from Mamaroneck Avenue, White Plains, to the terminal of the line at Westchester Avenue, White Plains, and on Aug. 3, 1912, the train service was continued over the Harlem River Branch tracks of the New York, New Haven & Hartford Railroad to Willis Avenue, New York, where connection is made with the Second and Third Avenue elevated lines of the Interborough Rapid Transit Company. The public patronage of these sections since their opening lends encouragement to the belief that further construction and contemplated connections and transfer facilities with the rapid transit lines of New York City will add very materially to the business of the road.

"The Public Service Commission for the First District of New York has approved the route for the extension of the Lenox Avenue branch of the subway, lying alongside the line of the New York, Westchester & Boston Railway from 180th Street to Unionport Road. Negotiations are under way for the sale of so much of the company's property as is required by the city for this route. The completion of this extension will mean a transfer point between the Westchester company and the subway. It is proposed that the station shall be joint and provide for transfer from one line to the other under cover.

"The Lexington Avenue subway, now under construction, will cross the Westchester company's line near Westchester Avenue in the Bronx, which will make a third transfer point for passengers of the New York, Westchester & Boston Railway to New York City rapid transit lines. This will give the company connection with two East Side lines, a line through the middle of Manhattan and one on the West Side.

"The interest on the advances by the New York, New Haven & Hartford Railroad for account of the New York, Westchester & Boston Railway amounted on June 30, 1912, to $1,675,489. As this money has not been repaid to the treasury no credit thereof has been taken in the income account of the company, but is held in suspense for consideration as a credit to income or profit and loss account when repaid.

"It is expected, and was estimated, that the New York, Westchester & Boston Railway Company's property would have to be carried for about three years from the opening of the same for business before it could become self-sustaining."

The report contains the income accounts for the year ended June 30, 1912, of the following subsidiary companies of the New York, New Haven & Hartford Railroad which operate street and electric railway properties in Massachusetts and Connecticut:

THE CONNECTICUT COMPANY.

Operating revenue:		
Freight revenue	$224,019	
Passenger revenue	7,582,024	
All other revenue from transportation	122,907	
Revenue from operations other than transportation	101,670	
Total operating revenue		$8,030,620
Operating expenses:		
Maintenance of way and structures	$972,974	
Maintenance of equipment	630,433	
Operation of power plants	932,975	

Operation of cars	1,877,614	
General expenses	562,485	
Miscellaneous expenses	135,818	
Total operating expenses		5,112,299
Net operating revenue		$2,918,321
Taxes		449,248
		$2,469,073
Income from other sources		62,541
Total income		$2,531,614
Deductions from income:		
Interest, rentals, etc.		1,012,539
Net income		$1,519,075

*The operating expenses and taxes were 69.25 per cent of the total operating revenue.

THE RHODE ISLAND COMPANY.

Operating revenue:		
Freight revenue	$213,417	
Passenger revenue	4,649,063	
All other revenue from transportation	57,487	
Revenue from operations other than transportation	125,039	
Total operating revenue		$5,045,006
Operating expenses:		
Maintenance of way and structures	$410,061	
Maintenance of equipment	435,996	
Traffic expenses	1,455	
Operation of power plants	529,955	
Operation of cars	1,198,528	
General expenses	517,836	
Miscellaneous expenses	105,019	
*Total operating expenses		3,198,850
Net operating revenue		$1,846,155
Taxes		378,487
		$1,467,668
Income from other sources		94,934
Total income		$1,562,602
Deductions from income:		
Interest, rentals, etc.		1,175,003
Net income		$387,599

*The operating expenses and taxes were 70.91 per cent of the total operating revenue.

BERKSHIRE STREET RAILWAY.

Operating revenue:		
Passenger revenue	$792,580	
All other revenue from transportation	19,832	
Revenue from operations other than transportation	72,331	
Total operating revenue		$884,743
Operating expenses:		
Maintenance of way and structures	$113,275	
Maintenance of equipment	93,462	
Traffic expenses	3,548	
Operation of power plants	171,164	
Operation of cars	188,658	
General expenses	76,930	
Miscellaneous expenses	1,047	
Total operating expenses		648,084
Net operating revenue		$236,659
Taxes		34,964
		$201,695
Income from other sources		3,040
Total income		$204,735
Deductions from income:		
Interest, rentals, etc.		164,986
Net income		$39,749

*The operating expenses and taxes were 77.20 per cent of the total operating revenue.

NEW YORK & STAMFORD RAILWAY.

Operating revenue:		
Passenger revenue	$350,182	
All other revenue from transportation	3,041	
Revenue from operations other than transportation	2,856	
Total operating revenue		$356,079
Operating expenses:		
Maintenance of way and structures	$33,449	
Maintenance of equipment	29,829	
Traffic expenses	1,117	
Operation of power plants	33,979	
Operation of cars	73,264	
General expenses	31,804	
Total operating expenses		253,442
Net operating revenue		$102,637
Taxes		18,119
		$84,518
Income from other sources		415
Total income		$84,933
Deductions from income:		
Interest, rentals, etc.		78,929
Net income		$6,004

*The operating expenses and taxes were 76.26 per cent of the total operating revenue.

Utilities Improvement Company Organized

Henry L. Doherty & Company, New York, N. Y., are offering $10,000,000 of preferred stock of the Utilities Improvement Company on the basis of $1,000 preferred and $400 common stock for $1,000 in cash. This is a new company which this firm has just organized. It has a total capitalization of $40,000,000, of which $25,000,000 is 6 per cent cumulative preferred and $15,000,000 common stock. The amount to be outstanding at once of each issue is $10,000,000. The firm announces that one-half of the present $10,000,000 offering is being taken by the same London interests that a short time ago purchased the preferred stock of the Cities Service Company and stock of the Consolidated Cities Light, Power & Traction Company. The new company has been formed to take over the following properties: Toledo Railways & Light Company; Danbury & Bethel Gas & Electric Light Company; Brantford (Ont.) Gas Company, Ltd.; Woodstock (Ont.) Gas Company, Ltd.; Athens Railway & Electric Company, Athens, Ga.; Coshocton District Gas & Fuel Company, Coshocton, Ohio; Bartlesville Gas, Electric & Railway Company, Bartlesville, Okla.; Empire Gas & Fuel Company, Kansas, Missouri and Oklahoma, and $2,800,000 six-year 7 per cent notes of the Southwestern Reserve Gas Company.

Of the company's common stock $5,000,000 is being reserved for future use under proper restrictions. The money derived from the present offering will be used to pay for from 25 to 77 per cent of the common stock of the Toledo property; 99.98 per cent of the Danbury property's common stock; 86.58 per cent of the Brantford property's common; all of the common stock of the Woodstock, Coshocton and Bartlesville properties; 98.33 per cent of the Athens property's common; 54.07 per cent of the Empire common; $2,800,000 six-year 7 per cent notes of the Southwestern Reserve Gas Company, and $1,040,000 par value 6 per cent preferred stock of the Toledo Railways & Light Company which is held under the terms of an underwriting agreement.

The following will be the officers and directors of the Utilities Improvement Company: Henry L. Doherty, president; Frank W. Frueauff, vice-president; Charles T. Brown, vice-president; Holton H. Scott, general manager; Paul R. Jones, secretary; Louis F. Musil, treasurer; William F. Hoffman, president of the Commercial National Bank, Columbus, Ohio; Leslie M. Shaw, president of the First Mortgage Guaranty & Trust Company, Philadelphia, Pa.; James Mitchell, of Sperling & Company, London, Eng.; Warren W. Foster, Judge of the Court of General Sessions, New York, N. Y., and James Satterfield, counselor at law, Dover, Del.

Plans for Reorganization of Toledo Railways & Light Company

Plans for the reorganization of the Toledo Railways & Light Company, Toledo, Ohio, have been agreed upon by the committees representing bondholders, secured creditors and stockholders of the company. The plan takes care of all present cash requirements of the company and provides resources for improvements, betterments and extensions in the immediate future to the extent of $2,000,000. The par value of all the securities contemplated to be taken over by the new company amounts to more than $32,000,000, whereas the outstanding capital of the new company, including bonds and capital stock, will be only about $22,000,000. The stockholders of the Toledo Railways & Light Company have the privilege of paying $7.50 per share, for which they will receive $7.50 in preferred stock and $43 in common stock of the new company. If they do not care to avail themselves of that privilege, they will receive $13 in the common stock of the company for each $100 of stock in the old company. Holders of the $4,866,000 of 4 per cent consolidated bonds of the company will receive the preferred stock of the new company to the amount at par of the principal of their bonds, the accrued interest on said bonds for the past five years being waived.

The plan contemplates the company taking over the

bonds and other obligations and liabilities, as well as the capital stock, of the Toledo Railways & Light Company, together with the securities of the Maumee Valley Railway & Light Company, the Toledo, Ottawa Beach & Northern Railway Company, the Toledo & Western Railway and the Adrian Street Railway. The securities of the new company will be divided as follows: First lien secured notes, $6,000,000; second lien secured notes, $1,200,000; preferred stock, $6,800,000; common stock, $8,000,000; total, $22,000,000. The $6,000,000 of first lien notes and $1,200,000 of second lien notes of the new company, or the proceeds of the sale thereof, will be used in caring for the outstanding $6,000,000 of first mortgage bonds of the Toledo Traction Company and the loans of the company, which are principally secured by some of the 4 per cent consolidated bonds of the company and the securities of the suburban electric railways.

Henry L. Doherty & Company have agreed to underwrite the subscriptions expected from the stockholders, amounting to $1,040,000, and also to assume the supervision and management of the operation of the properties for five years.

In the plan and subscription agreement of the Utilities Improvement Company, the organization of which is noted elsewhere in this department, Doherty & Company say in part:

"Our arrangement on the Toledo properties is with the bondholders and stockholders' committees and must be ratified by the majority of the stockholders of the old company. We are to receive 25 per cent of the common stock of the Toledo Light & Railways Company, which will be the name of the successor company, for agreeing to direct the management of the company for a period of five years and for underwriting (or in other words agreeing to buy if not bought by the old stockholders) $1,040,000 of 6 per cent cumulative preferred stock and $4,160,000 of common stock for $1,040,000 cash. This stock, however, is to be first offered to the old stockholders on the basis of $1,000 of 6 per cent preferred stock and $4,000 of common stock for $1,000 cash.

"Whatever portion of this underwriting is not taken by the old stockholders will be taken by this company. Therefore, the amount of common stock in Toledo Light & Railways Company which this company will acquire under this plan will be not less than 25 per cent and may be as much as 77 per cent. The common stock is to be placed in a voting trust which will contract with us for the management of the property."

Berkshire Street Railway, Pittsfield, Mass.—The Massachusetts Railroad Commission has authorized the Berkshire Street Railway to issue $330,000 of additional stock at par to pay the cost of the State line extension.

Brazilian Traction, Light & Power Company, Ltd., Montreal, Que.—An initial dividend of 1½ per cent has been declared on the $104,500,000 of stock of the Brazilian Traction, Light & Power Company, Ltd., for the quarter ended Oct. 31, 1912, payable on Nov. 15, 1912, to holders of record on Nov. 1, 1912.

Central Park, North & East River Railroad, New York, N. Y.—The property of the Central Park, North & East River Railroad will be sold under foreclosure on Oct. 31, 1912, by decree of the United States District Court, under the consolidated mortgage for $1,200,000.

Chicago Elevated Railways, Chicago, Ill.—The South Side Elevated Railroad has re-elected B. I. Budd and E. J. Doyle to the board and named E. C. Noe to replace J. H. Gulick. The Metropolitan West Side Elevated Railway has re-elected Howard G. Hetzler and Ira M. Cobe as directors and named W. W. Crawford and Paul D. Sexton to succeed E. J. Doyle and J. H. Gulick. The Northwestern Elevated Railroad has re-elected Henry A. Blair and W. V. Griffin as directors and named Charles H. Ireland to replace W. A. Fox.

Chicago & Oak Park Elevated Railroad, Chicago, Ill.—Judge Kohlsaat in the United States District Court at Chicago has denied the petition filed on Oct. 8, 1912, by counsel for minority stockholders and creditors asking that Samuel Insull be removed as receiver of the Chicago & Oak Park Elevated Railroad. Frederic A. Fischel, attorney representing the petitioners, was, however, authorized to examine the books of the company and received twenty days in which to prepare a brief to seek appeal from the decision.

Frankford, Tacony & Holmesburg Street Railway, Tacony, Pa.—The sale is reported of the one-third interest in the Frankford, Tacony & Holmesburg Street Railway which has been in the hands of Woelpper, Crawford & Company since the sale of the property of the company at foreclosure recently, for $375,000.

Halifax (N. S.) Electric Tramway.—F. B. McCurdy and associates are reported to have sold to a syndicate which includes J. W. McConnell and E. A. Robert, of the Montreal Tramways, about $400,000 of the outstanding $1,400,000 of stock of the Halifax Electric Tramway. It is said that $160 a share has been offered the other stockholders for their holdings, payment to be made to the Eastern Trust Company, Halifax, for such stock as is deposited with it.

Havana Electric Railway, Light & Power Company, Havana, Cuba.—An initial semi-annual dividend of 3½ per cent has been declared on the $15,000,000 of 6 per cent cumulative preferred stock of the Havana Electric Railway, Light & Power Company, payable on Nov. 16, 1912, to holders of record of Oct. 26. A dividend of 2¼ per cent has been declared on the $15,000,000 of common stock, payable at the same time.

Highland Park & Lake Burien Railroad, Seattle, Wash.—It is reported that negotiations are pending for the sale of the Highland Park & Lake Burien Railroad to interests which represent the Spokane & Inland Empire System. The Highland Park & Lake Burien Railroad extends from Seattle to Lake Burien, a distance of 9 miles. It was placed in operation on June 30, 1912.

New York State Railways, Rochester, N. Y.—The Public Service Commission of the Second District of New York has authorized the New York State Railways to merge the Utica & Mohawk Valley Railway, the Oneida Railway, the Syracuse Rapid Transit Railway and the Rochester & Suburban Railway. The New York State Railways has already acquired all of the outstanding stock of each of these companies. A public hearing was held on the application in this case at Syracuse and no opposition developed at the hearing. The authorization is made upon the condition that the New York State Railways shall so keep its books and accounts that the operation of the several systems shall be shown separately and that the separate accounts shall be reported annually for publication at the same time as the annual report of the New York State Railways is submitted to the commission.

Philadelphia & Western Railway, Upper Darby, Pa.—The Philadelphia & Western Railway has filed notice at Harrisburg of an increase in the capital stock of the company from $4,000,000 to $6,000,000 and a reduction of authorized debt from $20,000,000 to $4,000,000.

Riverside Traction Company, Camden, N. J.—The Riverside Traction Company has filed with the Secretary of State at Trenton a certificate showing that there have been sold $250,000 of 5 per cent fifty-year gold bonds of the company, secured by a mortgage to the West End Trust Company, Philadelphia, Pa., as trustee.

Southern Traction Company, Dallas, Tex.—The interurban electric railway recently completed by the Stone & Webster interests from Dallas to Waxahachie, 32 miles, is reported to have been sold to the Southern Traction Company, of which J. F. Strickland, Dallas, is president. The latter company is constructing a line between Waxahachie and Waco. It is also proposed to build a branch to Corsicana, about 35 miles. It was the purpose of the Southern Traction Company to construct its own line from Dallas to Waxahachie. The Southern Traction Company has an authorized capital stock of $7,500,000, of which $5,000,000 of common stock and $2,000,000 of preferred stock have been issued. The company has authorized $7,500,000 of first mortgage bonds and $500,000 of second mortgage 5 per cent thirty-year bonds. Power will be furnished by the Texas Power & Light Company, the principal plant of which will be located near Waco with transmission lines along the right-of-way of the Southern Traction Company.

Trenton & Elizabeth Railroad, Trenton, N. J.—The Trenton & Elizabeth Railroad has filed with the Secretary of State at Trenton a certificate showing that there have been sold $300,000 of the 5 per cent fifty-year gold bonds of the company secured by a mortgage to the Logan Trust Company, Philadelphia, Pa.

Warren, Brookfield & Spencer Street Railway, Brookfield, Mass.—Thomas T. Robinson, receiver of the Warren, Brookfield & Spencer Street Railway, has applied to the court for permission to issue $30,000 of receiver's certificates, the proceeds to be used for betterments and improvements.

Dividends Declared

Brazilian Traction, Light & Power Company, Ltd., Toronto, Ont., quarterly, 1½ per cent.

Brooklyn (N. Y.) City Railroad, quarterly, 2 per cent.

Columbus (Ohio) Railway, quarterly, 1¼ per cent, preferred.

Georgia Railway & Electric Company, Atlanta, Ga., quarterly, 1¼ per cent, preferred.

Havana Electric Railway, Light & Power Company, Havana, Cuba, 3 per cent, preferred; 2¼ per cent, common.

Memphis (Tenn.) Street Railway, quarterly, 1¼ per cent, preferred.

Mexico (Mexico) Tramways, quarterly, 1¾ per cent.

Milwaukee Electric Railway, Light & Power Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.

Rome Railway & Electric Company, Rome, Ga., quarterly, 1½ per cent.

West Penn Traction Company, Pittsburgh, Pa., quarterly, 1½ per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILROAD.

Period.			Gross Earnings.	Operating Expenses.	Net Earnings.	Fixed Charges.	Net Surplus.
1m.,	Aug.,	'12	$198,145	*$102,935	$95,210	$33,372	$61,838
1 "	"	'11	189,282	*96,700	92,582	32,492	60,090
2 "	"	'12	390,899	*205,231	185,668	66,676	118,993
2 "	"	'11	375,553	*192,189	183,363	65,016	118,347

BANGOR RAILWAY & ELECTRIC COMPANY.

1m.,	Aug.,	'12	$70,418	*$28,769	$41,649	$16,558	$25,091
1 "	"	'11	60,048	*24,074	35,974	13,020	22,954
2 "	"	'12	134,717	*57,601	77,116	33,117	43,999
2 "	"	'11	115,725	*50,883	64,842	26,076	38,766

CLEVELAND SOUTHWESTERN & COLUMBUS RAILWAY.

1m.,	Aug.,	'12	$117,208	$62,691	$54,517	$32,011	$22,506
1 "	"	'11	110,854	58,650	52,203	29,921	22,282
8 "	"	'12	768,531	453,510	315,021	245,523	69,498
8 "	"	'11	744,375	418,832	325,543	240,436	85,107

FEDERAL LIGHT & TRACTION COMPANY.

1m.,	July,	'12	$133,836	$*84,540	$49,296	.....	.....
1 "	"	'11	113,508	*76,243	37,265	.....	.....
7 "	"	'12	946,895	*561,405	385,490	.....	.....
7 "	"	'11	825,628	*496,201	329,427	.....	.....

NORTHERN OHIO TRACTION & LIGHT COMPANY.

1m.,	Aug.,	'12	$305,222	$160,343	$144,879	$50,526	$94,353
1 "	"	'11	272,624	143,666	128,958	44,321	84,637
8 "	"	'12	1,979,793	1,111,169	868,623	363,743	504,881
8 "	"	'11	1,773,731	981,692	792,039	354,749	437,290

ST. JOSEPH RAILWAY, LIGHT, HEAT & POWER COMPANY.

1m.,	Aug.,	'12	$102,859	*$58,262	$44,597	$19,710	$24,887
1 "	"	'11	92,959	*62,583	30,376	19,381	10,995
8 "	"	'12	768,350	*443,719	324,631	157,299	167,332
8 "	"	'11	715,656	*444,786	270,870	154,094	116,776

TEXAS TRACTION COMPANY.

1m.,	July,	'12	$55,323	$31,744	$23,579	$14,496	$9,083
1 "	"	'11	43,076	27,965	15,111	14,314	797

TWIN CITY RAPID TRANSIT COMPANY

1m.,	Aug.,	'12	$716,978	$354,385	$362,594	$143,079	$219,515
1 "	"	'11	671,324	317,043	354,282	140,079	214,203
8 "	"	'12	5,358,228	2,758,223	2,600,005	1,141,633	1,458,372
8 "	"	'11	5,163,343	2,583,392	2,579,952	1,120,633	1,120,623

UNION RAILWAY, GAS & ELECTRIC COMPANY.

1m.,	Aug.,	'12	$344,909	*$198,057	$146,852	$95,632	$51,220
1 "	"	'11	254,812	*142,477	112,335	62,402	49,933
8 "	"	'12	2,426,662	*1,447,352	979,310	595,472	383,838
8 "	"	'11	2,018,199	*1,182,179	836,020	488,475	347,545

PORTLAND RAILROAD COMPANY.

1m.,	Aug.,	'12	$118,155	*$60,592	$57,563	$10,294	$47,269
1 "	"	'11	120,406	*67,612	52,794	9,469	43,325
3 "	"	'12	229,739	*125,764	103,975	20,922	83,053
2 "	"	'11	233,358	*137,271	96,087	18,938	77,149

VIRGINIA RAILWAY & POWER COMPANY.

1m.,	July,	'12	$408,138	$211,715	$196,423	$7,589	$204,013
1 "	"	'11	404,526	209,734	194,792	4,104	198,896

*Includes taxes.

Traffic and Transportation

Decision of the California Commission in La Jolla Case

Brief mention was made in the Electric Railway Journal of Sept. 7, 1912, page 391, of the decision of the Railroad Commission of California declaring the passenger rates of the Los Angeles & San Diego Beach Railway, San Diego, Cal., unjust and ordering certain reductions. The complaint attacked the company's passenger rates, freight rates, service and equipment. The passenger rates were alleged to be unjust and unreasonably high and discriminatory. The freight rates were alleged to be unreasonable and the service and equipment were alleged to be inadequate. Particular complaint was made at the hearing before the commission on June 3, 1912, that the equipment was unserviceable and that insufficient trains were run to serve the needs of the public. Complaint was also made that all of the defendant's cars and trains did not stop at the station of Seaside and the commission was requested to direct the defendant to stop all its trains at Seaside and to print the names of all of its stations, including Seaside, on its timetables and conductors' tickets. The defendant in its answer denied all the material allegations of the complaint and averred that all of its rates were just and reasonable and non-discriminatory and that its service and facilities were adequate. The order of the commission, dated Aug. 23, 1912, follows:

"The commission finds as a fact that defendant's present passenger fares are unjust and unreasonable and discriminatory in so far as they vary from the fares hereinafter prescribed, and finds as a fact that the following passenger fares are just and reasonable and non-discriminatory:

Between San Diego and—	Single Trip.	Round Trip.	Monthly Individual Commutation, One Round Trip Daily
Hardy	$0.10	$0.20	$4.00
Morena	.15	.25	4.25
Mission Bay	.20	.30	4.50
Pacific Beach, Lamont Street	.20	.30	5.00
Pacific Beach, Haines Street	.20	.30	5.00
Pacific Beach, Ocean Front	.25	.35	5.25
Seaside	.25	.35	5.25
Glendol	.30	.40	5.50
Bird Rock	.35	.45	5.75
La Jolla Strand	.40	.50	6.00
South La Jolla	.40	.50	6.00
La Jolla	.40	.50	6.00

"In addition to the foregoing rates, defendant is also directed to adjust all its one-way passenger fares between any two stations on its line of railway, except as above indicated, to the basis of 3 cents per mile, with a minimum charge of 5 cents. Defendant is hereby directed to file and publish the fares in this order specified, effective twenty days from the service of this order.

"Defendant shall maintain its present time schedules until it shall first have secured the consent of the Railroad Commission to any proposed change therein.

"Defendant is directed to stop at Seaside for passengers having tickets to that station and on flag all its motor cars coming south and all its steam trains in either direction, except such trains going north as consist of more than three cars, and to print on all its timetables and tickets sold by agents or conductors the names of all stations, including Seaside.

"The complaint in this case in so far as it prays for the foregoing relief is hereby sustained and in other respects it is hereby dismissed."

On Sept. 16, 1912, the company appealed for a rehearing in the case.

New Transfer Rule in Salt Lake City.—The Utah Light & Railway Company, Salt Lake City, Utah, has instructed its conductors to issue transfers to passengers only at the time of payment of fare.

Three-Cent Fare Ordinance Introduced in Atlantic City, N. J.—Mayor Riddle, of Atlantic City, N. J., at a session of the City Commissioners introduced an ordinance fixing the fare for those who secure seats at 5 cents, with "strap-hangers" at 3 cents.

Ohio Commission Decides Against Use of Turnstiles in Cars.—The Public Service Commission of Ohio has decided against the use of turnstiles in the cars of the People's Railway, Dayton. The commission regards the equipment as dangerous in case of accident, since it closes one avenue of exit.

Rates of Fare for Moncton Line Approved.—The New Brunswick Board of Public Utility Commissioners has approved the following rates of fare on the Moncton Tramways, Electricity & Gas Company's line: single fare, 5 cents; ordinary tickets, six for 25 cents; workmen's and children's tickets, eight for 25 cents.

Complaint Against Service in Syracuse.—Complaint has been filed with the Public Service Commission of the Second District of New York against the service furnished by the Syracuse (N. Y.) Rapid Transit Railway on its East Genesee-Dudley line. It is alleged that insufficient cars are operated to care for the traffic properly.

Study of Electric Railway Freight Transportation.—Martin T. Roche, chairman of the public committee of the Association of Commerce of St. Paul, Minn., is visiting Detroit and other cities to gather data on the benefits of interurban railways to a city. He will study particularly the transportation of poultry, eggs and other farm products by electric railways.

Open Cars for Smokers in Brooklyn.—In deference to requests from smokers, the Brooklyn (N. Y.) Rapid Transit Company intends to run open cars, which are to be used as smoking cars, and which will be so labeled, until late in the fall this year, and possibly through the winter months. Only recently the company issued an order prohibiting smoking on its cars.

Restoration of Transfers Sought in Richmond.—Application has been made to the State Corporation Commission for an order requiring the Richmond & Rappahannock River Railway to restore the transfer privileges which obtained while the Seven Pines line was the property of the Virginia Railway & Power Company. The commission set Oct. 16 as the date for a hearing.

Experimental Single-Truck Prepayment Car Service in Albany.—The United Traction Company, Albany, N. Y., has fitted single truck car No. 527 for pay-as-you-enter service and has placed the car in service on the A Belt line as an experiment. Single-truck cars are run exclusively on the Pine Hills, West Albany, Delaware Avenue, Country Club, Arbor Hill and Rensselaer lines.

Cost of Columbus Terminal.—A report filed with the Public Service Commission of Ohio by the Ohio Electric Railway shows the cost of the interurban depot recently completed by the Columbus Interurban Terminal Company, which is owned by the Ohio Electric Railway. The funds were expended as follows: Land, $33,000; construction work, $144,133; trackage, $87,387; construction of freight depot, $16,438; furnishings for station, $1,309; electric sign, $1,000.

Cleveland Interurban Freight Matter.—City Solicitor Wilcox of Cleveland has rendered an opinion to the effect that the city has a right to insert in any franchise granted the Cleveland Railway to handle the freight cars of the interurban railways a clause regulating the rates to be charged on incoming foodstuffs. He is also of the opinion that such a franchise will not curtail the authority of the city over the company or make the company subject to the sole supervision of the Public Service Commission.

Free Transportation Offered to Officers and Men of American Fleet in New York.—Theodore P. Shonts, president of the Interborough Rapid Transit Company and the New York (N. Y.) Railways Company, wrote a letter to the Navy Department offering free transportation to the officers and men of the American fleet during the naval review in New York, Oct. 12 to 15. The Navy Department was compelled to decline both offers, as the act of Congress of Feb. 27, 1906, forbids accepting voluntary service for the government, but it expressed its appreciation of the offer.

Accidents in New York in August.—The Public Service Commission of the First District of New York has received the report of accidents on railroads and street railroads of New York City for August. During the month twenty-seven persons were killed and 242 were seriously injured. The number killed is three in excess of the same month last year, but nine less than in August, 1910. The total number of serious accidents is eight less than it was in August, 1911. The total number of injuries, including serious and not serious, was 4,334, of which 2,970 involved passengers, 635 employees and 729 other persons.

New Transfers in Louisville.—The Louisville (Ky.) Railway has announced that by Dec. 1, 1912, it will have completed arrangements for the use of transfer slips along the Second Street line in making connections with East and West Broadway cars. The entire city will then be subject to the new system of transfers. For a number of years the company has continued the use of car-to-car transfers along Second Street, allowing interchangeable privileges between the Second, East and West Broadway lines which use the same tracks along Second Street between Broadway and Jefferson Street.

New Wage Schedule in Providence, R. I.—A. E. Potter, vice-president of the Rhode Island Company, Providence, R. I., has announced an increase in wages of motormen and conductors on all divisions of the road, dating from Oct. 5, 1912. The new wage schedule is as follows: First year, 22 cents per hour; second year, 23 cents per hour; third year, 23½ cents; fourth year, 24¾ cents; fifth year, 26¼ cents; sixth year and thereafter, 27½ cents. The old scale was as follows: First year, 21¾ cents an hour; second year, 22¼ cents an hour; third year, 23 cents an hour; fourth year, 24½ cents an hour; fifth year, 26 cents an hour; sixth year and thereafter, 27 cents an hour.

Illinois Road Ordered to Install Toilets on Interurban Cars.—The Illinois Railroad & Warehouse Commission has ordered the Alton, Granite & St. Louis Traction Company, Alton, Ill., to install toilets on its interurban cars within thirty days from Sept. 16, 1912. Cars running between East St. Louis, Alton, Belleville, Mitchell and Edwardsville will be affected by the new ruling. It was contended before the commission that the line was a street railway and not subject to the jurisdiction of the commission. The commissioners held, however, that lines that did an intercity business might properly be classed as railroads. The commission also suggested that drinking tanks should be installed on the cars.

Accident Fakers Confess in Baltimore.—Confessing that they conspired to defraud the United Railways & Electric Company, Baltimore, Md., of $200 by reporting a fictitious accident, Charles Forrest and Mrs. E. L. Mueller have been held in default of $1,000 bail for the action of the grand jury. Forrest was in the service of the company about a month. In her confession the woman said: "After Forrest had been discharged from the railway service he told me he had written an accident report stating I had fallen off a car. I told him I did not approve of it. Later I told agents of the company I had fallen from a car. As a matter of fact, I hurt my knee by falling at Nachman's Hotel, where I had gone one night after having a quarrel with Forrest."

Complaint Filed with Interstate Commerce Commission.—The Louisville Board of Trade, the Belknap Hardware & Manufacturing Company and seven other business establishments located in the city of Louisville, Ky., have filed a complaint with the Interstate Commerce Commission at Washington, D. C., against the Indianapolis, Columbus & Southern Traction Company, the Louisville & Southern Indiana Traction Company and the Louisville & Northern Railway & Lighting Company, together with the Louisville & Indianapolis Traction Railway and eighteen other electric railways which operate in Indiana, Ohio and Michigan. The commission is asked to require through routes and reasonable joint rates upon express shipments of all commodities via electric railway from Louisville to Indianapolis and to other northern points.

Re-routing in Louisville.—A plan to re-route a number of the most important lines of the Louisville (Ky.) Railway is in the hands of Samuel Riddle, superintendent of traffic. Thomas J. Minary, president of the company, has announced that the new cross-town line, which has been under construction for a year, will be in operation by Nov. 15. This line extends from Twenty-eighth and Du-

mesnil Streets, in the extreme southwestern portion of the city for 6 miles through the southern residential portion to the extreme southeastern district at Winter Avenue and the Bardstown Road, making connections with important through lines at both of its terminals. The changes in the present routes of through cars will be made about the time that the new cross-town line is opened.

Traffic Developments of the Louisville & Northern Railway & Light Company.—The Louisville & Northern Railway & Light Company, New Albany, Ind., across the Ohio River from Louisville, has transferred from Louisville to Jeffersonville and New Albany, Ind., the two electric trucks with which it has been handling express business in Louisville and contemplates enlarging its facilities in this connection. The Louisville & Northern Railway & Light Company will probably provide new trucks to cover the Louisville district in the near future. In the hope of boosting traffic between Louisville and Glenwood Park, on the Indiana side of the Ohio River, the company is co-operating with several fraternal orders in New Albany, Ind., which propose to hold a "fall festival" with music and Chautauqua entertainment at the park.

Hearing in Regard to Service and Fares Between Schenectady and Ballston Lake.—At the continued hearing before the Public Service Commission of the Second District of New York in regard to the complaint of residents of Ballston Lake against the Schenectady (N. Y.) Railway alleging insufficient service and asking for a 10-cent fare between Ballston Lake and Schenectady, Attorney Lewis E. Carr, who with Attorney Hubbell Robinson, appeared for the company, said that he would arrange for an early conference with representatives of the complainants and assured the commission that he would do his best to secure a peaceful settlement of the service question between Ballston Lake and Schenectady. This was satisfactory to Attorney J. W. Verbeck and C. I. Johnson, who appeared for the complainants. At some future date that portion of the complaint asking for reductions in fares on this division will be considered at a hearing.

Hearing Closed in Amsterdam-Hagaman Fare Case.—John B. Olmsted, of the Public Service Commission of the Second District of New York, held an adjourned hearing on Oct. 15, 1912, on the complaint of residents of Hagaman against the Fonda, Johnstown & Gloversville Railroad. The complainants seek a reduction in fare from Hagaman and Amsterdam from 10 cents to 5 cents. Hagaman has a population of 875. The complaint recited that the 10-cent fare is a hardship to the students who attend school in Amsterdam. The distance between Hagaman and Amsterdam is 5 miles. One fare of 5 cents is collected to Harrower station, a distance of 4 miles, and the additional fare for the remaining mile to Hagaman. The company contended that because of the physical location of the Hagaman line its construction and maintenance is unusually expensive. Chief Engineer Bagg told of the difficulties of construction and in keeping the line open during heavy snows in winter. The case was closed and decision reserved.

Important Terminal Plans at Los Angeles.—Paul Shoup, president of the Pacific Electric Railway, has made public the plans proposed by the company for depot and trackage facilities to relieve the present congestion, contingent upon the final granting of the San Pedro Street franchise. A one-story waiting room, with ticket offices and train sheds to accommodate practically all the suburban trains which run out of the company's station, except the Glendale lines, to be built on the block east of the Pacific Electric building, are the prominent structural features of these plans. It is estimated that the expenditure on the terminal facilities and the tracks on San Pedro Street from Aliso to Ninth Street will be $300,000. Of this amount, the estimated cost of the San Pedro Street tracks is $200,000, leaving $100,000 as the probable cost of the depot annex and trackage. The new depot will have a frontage of 225 ft. on Los Angeles Street and 150 ft. on Sixth Street. From its easterly side train sheds will extend nearly to Maple Avenue to accommodate the six tracks that will be constructed from Sixth Street and furnish station room for trains over the San Pedro Street tracks via Sixth Street.

Personal Mention

Mr. William C. Hawkins, formerly general manager of the Dominion Power & Transmission Company, Hamilton, Ont., has been elected managing director of the company.

Mr. C. P. Orth, for the last five years master mechanic of the Galesburg & Kewanee Electric Railway, Kewanee, Ill., has resigned from the company on account of ill health.

Mr. E. C. Faber, general manager of the Aurora, Elgin & Chicago Railroad, Wheaton, Ill., has been elected vice-president of the company. Mr. Faber retains the title of general manager.

Mr. Frank K. Shuff has resigned as general manager of the Boone (Ia.) Electric Company, to accept the position of superintendent of the Fort Dodge, Des Moines & Southern Railroad, Boone, Ia.

Mr. Edward P. Coleman, formerly manager of railways of the Dominion Power & Transmission Company, Hamilton, Ont., has been appointed general manager to succeed Mr. William C. Hawkins.

Mr. William C. Angus, formerly assistant to the general manager of the Dominion Power & Transmission Company, Hamilton, Ont., has been appointed general superintendent of light and power of the company.

Mr. Matthew R. Boylan, the new secretary-treasurer of the American Electric Railway Accountants' Association, is a veteran in service if not in years. He was born in Jersey City, N. J., and began his railroad career in 1892 as stenographer and clerk in the office of C. B. Thurston, president Jersey City & Bergen Railroad, a horse car line. During the next few years the Jersey City system was electrified, and Mr. Boylan went from his clerical position through the transportation department, the shops and the power generating stations. Meantime the Jersey City & Bergen Railroad was absorbed by the Consolidated Traction Company and the latter was leased to the North Jersey Street Railway. In 1899 Mr. Boylan was placed in the general auditor's department as voucher clerk. After serving successively as bookkeeper, chief clerk and assistant auditor he was, in 1904, made general auditor of the Public Service Railway, which had acquired the North Jersey Street Railway the year previous. Mr. Boylan has served on many important committees of the Accountants' Association and his name appears on numerous reports covering problems in street railway accounting. In 1910 Mr. Boylan was elected first vice-president of the association, but retired last year when Mr. P. S. Young, comptroller Public Service Railway, was made president.

M. R. Boylan

Mr. George E. Waller, formerly general freight and passenger agent of the Dominion Power & Transmission Company, Hamilton, Ont., has been appointed general superintendent of railways of the company, assuming the duties formerly performed by Mr. Edward P. Coleman, but the title of manager of railways has been changed to that of general superintendent of railways.

Mr. J. W. Sherwood has been appointed superintendent of transportation of the Mobile Light & Railroad Company, Mobile, Ala. Mr. Sherwood began his railroad career with the New York Central & Hudson River Railroad. In 1895 he entered the service of the Brooklyn Heights Railroad, Brooklyn, N. Y., under the general superintendent. Subsequently he spent more than a year familiarizing himself at the different carhouses with the details of management in order to fit himself for the position of chief clerk to the general superintendent. In 1902 Mr. Sherwood became connected with the Public Service Corporation of New Jersey under Mr. W. W. Wheatley, general manager. In 1903 Mr. Sherwood resigned from the Public Service

Corporation to become assistant general manager of the Mexico (Mex.) City Railway.

Mr. S. W. Mower has resigned as general manager of the London & Lake Erie Railway & Transportation Company, London, Ont., to become manager of the Otsego & Herkimer Railway, Hartwick, N. Y., effective on Nov. 1, 1912, to succeed Mr. Joseph K. Choate, resigned, who, it is reported, will become connected with the Morris County Traction Company, Morristown, N. J. Mr. Mower was born at Grand Haven, Mich., on Aug. 13, 1876. In 1890 he moved to Detroit, and in 1900 entered the service of the Detroit (Mich.) United Railway as assistant to Mr. Albert H. Stanley, then general manager of the company. Five years later he was appointed assistant superintendent of the Port Huron division of the Michigan United Railway. In June, 1906, he was appointed general manager of the Southwestern Traction Company, now the London & Lake Erie Railway & Transportation Company. Mr. Mower was secretary-treasurer of the American Electric Railway Engineering Association from its organization in 1903 until 1908.

S. W. Mower

Mr. George A. Gilfillan has resigned as acting general manager and consulting engineer of the Morris County Traction Company, Morristown, N. J. Mr. Gilfillan became connected with the Morris County Traction Company about two years ago in charge of the construction work. On the resignation of Mr. H. H. Archer as general manager he was appointed acting general manager of the company.

Mr. J. Henry Neal, who has been elected president of the American Electric Railway Accountants' Association, is general auditor of the Boston (Mass.) Elevated Railway. He was born in Boston forty years ago, and has been connected with the West End Street Railway, Boston, and the Boston Elevated Railway, which succeeded the West End Street Railway, for twenty-four years. He is a certified public accountant. Mr. Neal is a close student of electric railway work, and besides the distinction which he enjoys as an expert accountant is familiar with both the mechanical and electrical engineering problems which have had to be met in electric railway work. He has obtained a number of patents, not a few of which are for devices in use in the railway field. Perhaps the best known device of which he is the inventor is the Neal electric headlight.

J. Henry Neal

OBITUARY

Adrian Hoffman Joline, who with Mr. Douglas Robinson was receiver of the Metropolitan Street Railway, New York, N. Y., died on Oct. 15, 1912, at his home in New York. Mr. Joline was sixty-two years old. Mr. Joline was a lawyer by profession, but he gave a great deal of attention to the management of various railroad properties. His work as receiver of the Metropolitan Street Railway occupied the greater part of the last four years of his life. Mr. Joline attended Mount Pleasant Military Academy, and in 1870 was graduated with honors from Princeton College. He studied law at the Columbia Law School. At the time of his death he was a member of the law firm of Joline, Larkin & Rathbone, New York, N. Y.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Conneaut, Kingsville & Ashtabula Railway, Kingsville, Ohio.**—Incorporated in Ohio to build an electric railway between Conneaut and Ashtabula and to furnish light and power to these cities. Capital stock, $25,000. Incorporators: William E. Hawley, Raymond C. Thompson and Charles E. Hawkins.

Charleston & Summerville Interurban Railway, Charleston, S. C.—Chartered in South Carolina to build a 20-mile electric railway between Charleston and Summerville and several miles of track in Charleston. Right-of-way has been secured and construction will be begun as soon as financial backing has been obtained. Capital stock, $500,000 to $1,000,000. Officers: J. L. David, president; E. W. Hughes, secretary; M. M. David, treasurer, and J. A. Hertz, J. D. Harby, J. L. David, E. W. Hughes and M. M. David, board of directors. [E. R. J., Aug. 31, '12.]

FRANCHISES

Tuscaloosa, Ala.—The Tuscaloosa Belt Line has received the approval of the City Commissioners for the extension of a double-track line on Greensboro Avenue in Tuscaloosa. [E. R. J., Sept. 28, '12.]

***Little Rock, Ark.**—A. C. Read, who is connected with the Southern Trust Company, Little Rock, has asked the City Council for a franchise to build an electric railway to afford service between Little Rock and Neimeyer's mill.

Rialto, Cal.—The Crescent City Railway, Riverside, has received a franchise from the Council in Rialto. This is part of a plan to build a line between Rialto and Riverside.

Richmond, Cal.—The Southern Pacific Company has asked the City Council for a franchise to extend its lines into Richmond. The company has purchased the Nicholl franchise in the western part of the city.

East Lyme, Conn.—The New London & East Lyme Street Railway has received approval from the Public Service Commission of the proposed method of construction of a line from Flanders in East Lyme to the Connecticut River bridge in Old Lyme.

Grass, Ind.—The Evansville, Chrisney & Eastern Railway, Evansville, has received a franchise from the Commissioners of Spencer County to build its line over the highway in Grass. This line will connect Chrisney, Evansville and Boonville. J. P. Chrisney, president. [E. R. J., Aug. 17, '12.]

***Iowa City, Ia.**—The Iowa Construction Company has received a franchise from the Council in Iowa City. This company plans to build an electric railway between Iowa City and Ottumwa. Among those interested are: Frank Tanner, Iowa City, president of the Iowa City-Ottumwa Interurban Company; Albert Tanner and H. L. Stiles, Milwaukee.

Decatur, Ga.—The Georgia Railway & Electric Company has accepted the amended franchise for the extension of the South Decatur line to Stone Mountain and construction of the line will soon be begun.

Macon, Ga.—The Macon Railway & Light Company has asked the Mayor and City Council for a franchise to make certain changes in its routes through Macon.

Rockland, Mass.—The Bay State Street Railway has asked the Council for a franchise to extend its lines in Rockland.

***Fenton, Mich.**—The Independent Power Company has received a franchise from the Common Council in Fenton. This is part of a plan to build an electric railway between Flint and Fenton.

St. Louis, Mo.—The St. Louis Electric Terminal Railroad, a branch of the Illinois Traction System, has received a franchise to lay a short switch track to connect its lines with industrial tracks under the east approach of the McKinley Bridge at Hall Street, in St. Louis.

Galt, Ont.—The Lake Erie & Northern Railway, Brantford, has asked the Town Council for a franchise in Galt.

Portland, Ore.—The Portland Railway, Light & Power Company has received a franchise from the Council to extend its Mount Tabor line. Nearly $1,000 has been subscribed toward the extension of the company's Hawthorne Avenue line from the present terminus of the tracks at Division and East Sixtieth Street to East Seventy-fourth Street via Twenty-ninth Avenue in Portland.

Pittsburgh, Pa.—The Pittsburgh Railways has received a franchise from the Council on Fifth Avenue, Smithfield Street and Wood Street in Pittsburgh.

West Newton, Pa.—The West Penn Railways has received a perpetual franchise from the Council for the operation of a line in connection with the Hunker-West Newton extension. Surveys for this line have been made.

*Austin, Tex.—E. W. Brown, Orange; W. B. Dunlap and Walter L. Crawford, Beaumont; John W. Maxcy, Houston, and J. M. Abbott, Seguin, have received a fifty-year franchise from the County Commissioners in Travis County and for the use of the bridge across the Colorado River at the foot of Congress Avenue in Austin. The promoters of this project will now file application with the City Council of Austin for a franchise to use certain streets in Austin. This is part of a plan to build an electric railway between Austin and Lockhart, a distance of about 35 miles. It is stated that this line will ultimately be extended to San Antonio via Seguin.

*Tazewell, Va.—The County Board of Supervisors has granted a franchise to the Continental Development & Investment Company, Dayton, Ohio, for the construction of an interurban line through Tazewell County, from Tazewell to Graham. From Graham the line will be extended by way of Bluefield and Princeton to Hinton, W. Va., on the Chesapeake & Ohio Railway, a distance of 90 miles. The Appalachian Power Company is believed to be interested in the new line.

TRACK AND ROADWAY

Edmonton (Alta) Interurban Railway.—M. Kimpe, managing director, has announced that this company, incorporated in 1910 and reorganized on September 16 last, will build an electric railway system to connect Edmonton with numerous towns in central Alberta. J. W. McLeod, contractor for construction, has 150 men on the grade for the first unit of 6 miles, from the northwestern city limits to St. Albert, where a power house, with sufficient capacity to operate 26 miles of line, will be erected. Temporary offices have been established at 248 Jasper Avenue, Edmonton. The company is headed by George Barbey of Paris and Vancouver, who is president of the Franco-Canadian Company, and among the directors are M. Bureau, Edmonton, president of the Franco-Canadian Mortgage Corporation, and J. H. Gariepy, Edmonton.

Fort Smith Light & Traction Company, Fort Smith, Ark.—This company has placed in operation its extension to South Fort Smith.

Pacific Electric Railway, Los Angeles, Cal.—This company has completed the ballasting for its double-track line into Owensmouth and will place the line in operation before Nov. 1. Bids have been asked for the construction of the Colton Avenue link that will connect San Bernardino and Riverside. The line will be a continuation of the Riverside end which was built toward San Bernardino several years ago. It will pass through Colton and then parallel the Southern Pacific track down Colton Avenue to Urbita Springs and San Bernardino.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—Work will be begun at once by this company on its line through the eastern part of Suisun County.

Crescent City Railway, Riverside, Cal.—Work will be begun at once by this company on the extension from Bloomington Rialto. Right-of-way has been secured.

Southern Pacific Company, San Francisco, Cal.—It is reported that this company plans to build a line between San José and the California Redwood Park in the big basin.

San Joaquin Valley Electric Railway, Stockton, Cal.—It is reported that plans are completed and construction will be begun at once on this company's line from Stockton to Modesto via Manteca, Ripon, Salida and Woods Colony.

Tidewater & Southern Railroad, Stockton, Cal.—This company has placed in operation its line between Modesto and Turlock.

Sacramento Valley West Side Electric Railway, Willows, Cal.—Surveys have been begun under R. Pierce, of the Dozier Construction Company in Woodland, to extend the line to a point on the proposed Oakland, Antioch & Eastern Railway near Denverton. This railway will connect Red Bluff, Tehama, Corning, Orland, Yalo, Woodland, Dixon, Sacramento and San Francisco. Charles L. Donohue, Willows, president. [E. R. J., Oct. 12, '12.]

Waterbury & Milldale Tramway, Waterbury, Conn.—Work will be begun at once by this company on its line from the easterly part of Waterbury through the Mill Plain suburb and by summer resorts at Lake Hitchcock, through Marion to Milldale. Here it will connect with the line of the Connecticut Company between Meriden and New Britain via Southington and Plainville. Charles H. Clark, Milldale, president. [E. R. J., Jan. 7, '11.]

Georgia Railway & Electric Company, Atlanta, Ga.—Plans are being made by this company to build a 7-mile line from College Street in Decatur, extending in an easterly direction to a point near Clarkston, where it will probably form a connection with the new interurban line now being constructed from Stone Mountain toward Atlanta.

Chattanooga & Chickamauga Interurban Railway, Rossville, Ga.—Work has been begun by this company on its line between Chattanooga and Fort Oglethorpe. Much of the distance between the two points will be double-tracked. Frank Spurlock, Chattanooga, is interested. [E. R. J., Sept. 28, '12.]

Waycross Street & Suburban Railway, Waycross, Ga.—Orders have been placed by this company for rails of a sufficient quantity to lay more than 3 miles of additional track in Waycross.

Indiana Union Traction Company, Anderson, Ind.—This company has awarded the contract for grading its 8-mile line between Muncie and Oakville to Frank Hines, Peru, Ind.

Evansville (Ind.) Street Railway.—Surveys have been completed by this company for the extension of its Henderson line to Owensboro, Ky.

Interstate Interurban Railway, Arkansas City, Kan.—This company advises that during the next sixty days it will begin the construction of its 50-mile electric railway to connect Arkansas City and Ponca City via Chilocco, Blackwell, Billings and El Reno, Okla. The power station and repair shops will be located at Blackwell. Capital stock authorized, $500,000. Bonds authorized, $500,000. Officers: O. L. Brown, Arkansas City, Kan., president, and S. K. Titus, Arkansas City, chief engineer. [E. R. J., Sept. 14, '12.]

Hutchinson & Western Interurban Railway, Hutchinson, Kan.—Preliminary arrangements are being made by this company to have work under way on grading by Nov. 1. As soon as the necessary stock has been subscribed the company will award contracts. This railway will connect Hutchinson and Hudson, via Huntsville, Larned and Great Bend. E. P. Roehr, general manager. [E. R. J., Aug. 31, '12.]

Algiers Railway & Lighting Company, Algiers, La.—This company has practically completed its extension to the immigration station and also its new belt line in Algiers. Work on its Amesville-Waggaman extension is well under way.

Commercial Oil & Gas Company, Shreveport, La.—This company advises that it has not yet formulated any definite plans for an electric railway from the Greenwood road in Shreveport to the natatorium near the fair grounds. Officers: Thomas P. Lloyd, president; Edgar B. Hardy, vice-president and general manager; A. A. Heold, secretary and treasurer. [E. R. J., Sept. 21, '12.]

Eastern Shore Power, Light & Railway Company, Annapolis, Md.—This company has asked permission of the Public Service Commission to issue stocks and bonds to operate an electric railway from Deal's Island, through

Princess Anne and Snow Hill, to a point on Sinnepuxent Bay. It is proposed to issue $1,000,000 of stock and $1,000,000 in bonds. Lewis M. Milbourne, Princess Bay, Md., president. [E. R. J., Oct. 5, '12.]

Berkshire Street Railway, Pittsfield, Mass.—This company has received the approval of the State Railroad Commission to build its line on private land in Lee, and it has also approved the location for the company's tracks in West Street and in New West Street in Pittsfield.

Electric Short Line Railroad, Minneapolis, Minn.—Construction of the terminal tracks from Western and Penn Avenues to Second Avenue N and Seventh Streets, to be utilized by this railway, has begun at the city limits; also of the main line from the present terminus at Medicine Lake southwesterly to Lake Minnetonka. Grant Smith & Company, St. Paul, have the contract for building the terminal trackage, and H. F. Balch for the line from Medicine Lake to Lake Minnetonka. Gervais & Rocheford are the sub-contractors for the piling work on the Smith Company contract. The company already has about 10 miles of rails laid between the city limits at Western Avenue and Medicine Lake. [E. R. J., Oct. 21, '11.]

Charlotte Electric Railway, Light & Power Company, Charlotte, N. C.—This company plans to build a new overhead bridge in place of the structure which spans the tracks of the Southern Railway on East Morehead Street in Charlotte.

Dayton, Covington & Piqua Traction Company, West Milton, Ohio.—This company desires to extend its line from Covington to Bradford and from Bradford to Loramie in the near future and has applied to the Ohio Public Service Commission for permission to issue $400,000 of bonds from the proceeds of which to carry out the work.

Port Arthur & Fort William Electric Railway, Port Arthur, Ont.—The ratepayers of Port Arthur passed by-laws on Sept. 16 to issue debentures to extend the street railway in Port Arthur as follows: On Queen Street, from Algoma Street to High Street; from its present eastern terminus to Codder Avenue; to extend the railway easterly to Hedge Siding; to construct a belt line electric railway and to open up a new street from Codder Avenue to Hedge Siding in connection with the second and third of the proposed extensions.

***Stratford, Ont.**—William Mackenzie, Toronto; C. J. Rotherey and associates plan to build an electric railway in Stratford. Preliminary arrangements are under way and a franchise will soon be asked.

Oregon Electric Railway, Portland, Ore.—This company placed in operation on Oct. 15 its line to Eugene.

Portland, Eugene & Eastern Railway, Portland, Ore.—Preliminary surveys are being made by this company for a line leading into the Pleasant Hill and Creswell section. The survey was begun at Goshen, 5 miles south of Eugene, on the main line of the Southern Pacific Railroad. From Creswell the line will return to Eugene over another route which extends past Spencer's Butte and enters Eugene from the south.

Bloomsburg, Millville & Northern Railway, Bloomsburg, Pa.—This company plans to build 2 miles of new track this fall and about 7 miles of new track in the spring.

Hagerstown, State Line, Greencastle & Mercersburg Railway, Middleburg, Pa.—Surveys have been made by this company for its projected 21-mile electric railway from Hagerstown, Md., via Morgansville, State Line, Greencastle and Upton to Mercersburg. The capital for construction has been secured in part. J. B. Ferguson & Company, Hagerstown, Md., are the engineers. [E. R. J., June 1, '12.]

Greenville (S. C.) Traction Company.—This company has completed and will soon place in operation its new double-track line on Pendleton Street in Greenville.

Southern Traction Company, Dallas, Tex.—This company, which is building an electric railway between Dallas and Waco, plans to build soon a 33-mile extension from Waco to Temple. J. F. Strickland, Dallas, president.

Tyler City Light & Railway Company, Tyler, Tex.—This company advises that work has been begun and material has all been contracted for to build its 5-mile line in Tyler. Its power station will be located at Tyler and it will furnish power for lighting purposes. Officers: John H. Barkman, Osborn, Ohio, president; C. S. Kimmel, Clayton, Ohio, vice-president; Charles H. Warford, Dayton, Ohio, secretary and treasurer, and William C. Thayer, Tyler, chief engineer. [E. R. J., Sept. 28, '12.]

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company has been asked to consider plans to extend its lines along Illinois Street from Meridian Street to the plant of the Olympic Portland Cement Company.

Yakima Valley Transportation Company, North Yakima, Wash.—During the next few weeks this company plans to pave ½ mile of track of its Summitview line in North Yakima.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—Work has been begun by this company on the construction of a new station at the corner of Garey Avenue and Walnut Street in Pomona. This company will also build six new brick buildings at Redondo Beach in the near future. The structures will be used for shops and carhouses. One will be 200 ft. x 460 ft., another 130 ft. x 200 ft., another 40 ft. x 110 ft., another 40 ft. x 85 ft. and two others 40 ft. x 40 ft.

Tri-City Railway, Davenport, Ia.—Work will soon be begun by this company on its new carhouse on Fifth Avenue in Rock Island.

Southwestern Traction & Power Company, New Orleans, La.—This company plans to build its repair shops and headquarters at Lafayette.

Berkshire Street Railway, Pittsfield, Mass.—This company plans to build a new carhouse at McGraw's switch between Great Barrington and Sheffield. The contract for the work has been awarded to the Fred T. Ley Construction Company. The structure will be 300 ft. long and of brick construction and large enough to store thirty cars.

Lake Erie & Northern Electric Railway, Brantford, Ont.—This company plans to build a new station at Main Street in Galt in the near future.

Bloomsburg, Millville & Northern Railway, Bloomsburg, Pa.—During the next few weeks this company plans to begin work on a new carhouse in Bloomsburg.

POWER HOUSES AND SUBSTATIONS

Birmingham Railway, Light & Power Company, Birmingham, Ala.—This company plans to build soon a new substation on its North Birmingham line. It is reported that the equipment will cost about $30,000.

British Columbia Electric Railway, Ltd., Vancouver, B. C.—The Puget Sound Bridge & Dredging Company, Seattle, Wash., has closed a contract with the British Columbia Electric Railway for the construction of a large dam on the Jordan River. The dam will form a part of the Jordan River hydroelectric system, which the company is developing to secure an output of 36,000 hp. The dam will be 800 ft. x 115 ft. It will be of the Ambursen type of construction. The contract calls for an expenditure of approximately $500,000. Preliminary operations have been started and it is expected the work will be completed in eight months.

Pacific Electric Railway, Los Angeles, Cal.—A number of improvements are being made by this company on its lines in Pomona. Among them will be the construction of a new substation at Ganesha Junction, where the Pacific Electric Railway connects with the Southern Pacific Railway.

San Joaquin Valley Electric Railway, Stockton, Cal.—A new substation is being constructed by this company in Stockton.

Louisville (Ky.) Railway.—A contract has been awarded to Fred Leezer, Louisville, by this company for the brickwork on the new power house of the company at Twenty-first and High Streets. The Henry Bickel Company has received a contract covering the excavation and concrete work on the structure.

Duluth (Minn.) Street Railway.—This company has purchased a tract of land on Thirty-fourth Avenue East and Fourth Street in Duluth and will build a new substation on this site.

Manufactures and Supplies

ROLLING STOCK

Birmingham, Ensley & Bessemer Railway, Birmingham, Ala., has ordered from The J. G. Brill Company ten car bodies mounted on Brill 27-MCB-2 trucks and five extra pairs of Brill 27-MCB-2 trucks.

Brandon (Man.) Municipal Railway will receive tenders for ten cars until Nov. 15 at 4 p. m. Copies of plans and specifications may be had upon application to the street railway engineer, Brandon, Man., Canada.

Cincinnati (Ohio) Traction Company, reported in the Electric Railway Journal of Aug. 5, 1912, as having ordered seventy-six closed pay-within cars from the Cincinnati Car Company, has specified the following details for this equipment:

Seating capacity.....42	Cables..Amer. Steel & Wire
Weight (car body only) 14,000 lb.	Car trimmings .....Dayton
	Control ..single-end K-40-A
Bolster centers, length, 21 ft. 0 in.	Curtain fixtures, Nat. L. W. Co.
Length of body...33 ft. 0 in.	Curtain material ..Pantasote
Length over vestibule, 44 ft. 0 in.	Destination signs....Hunter
	Gongs .....Dayton
Width over sills...8 ft. 0 in.	Hand brakes.....Nat. Brake
Width over all.....8 ft. 0 in.	Heaters .....Smith
Height, rail to sills...36½ in.	Headlights .....Dayton
Sill to trolley base.8 ft. 5½ in.	Motors...two West. No. 318
Body .....semi-steel	Motors .....outside-hung
Interior trim .....mahogany	Registers .....Int.
Headlining ....¼-in. veneer	Seats .....long
Roof .....monitor	Seating material.....rattan
Underframe .....steel	Step treads .....Mason
Air brakes, Nat. Brake & Elec.	Trucks.....Brill max. trac.

TRADE NOTES

Herbert L. Towle, Philadelphia, Pa., has removed his office to the Philadelphia National Bank Building, 421 Chestnut Street, Philadelphia, Pa.

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has removed its general sales department to the works at Niagara Falls, N. Y., and has established a district office at Pittsburgh, Pa.

S. Jarvis Adams Company, Midland, Pa., announces that it has changed its name to Pittsburgh Iron & Steel Foundries Company and that its general offices will be located at the works at Midland, Pa.

Goldschmidt Thermit Company, New York, N. Y., has appointed D. B. Browne its metallurgical engineer with headquarters in New York. Mr. Browne was recently New York representative for the American Vanadium Company.

Crane Company, Chicago, Ill., has appointed Edmund Burke assistant manager of the specialty department to succeed F. W. Venton, who goes to the Detroit branch of the Crane Company as assistant manager. D. G. Park, assistant to the secretary, has been appointed office manager of the general offices of the company in Chicago.

Bullock Electric Manufacturing Company, Milwaukee, Wis., a subsidiary of the Allis-Chalmers Company, has elected Otto H. Falk, receiver of the Allis-Chalmers Company; M. W. Babb and E. T. Pardee directors to succeed E. H. Gary, E. D. Adams and G. C. Merckel. Upon organization, the directors elected Otto H. Falk president, in place of E. D. Adams, and E. T. Pardee vice-president and general manager, to succeed D. W. Call.

Frank Koester, New York, N. Y., consulting engineer, has removed his office from 115 Broadway to larger quarters at 50 Church Street, New York. Mr. Koester is principally engaged in steam and hydroelectric power plant work, electric transmission and traction. He recently finished the plans for a central asphalt repairing plant of 3000 sq. yd. daily capacity, for which he was retained as an expert by the borough of Manhattan, New York.

Kern Dodge, the well-known engineer of Philadelphia, has returned from a year's travel abroad and opened an office in the Morris Building, Philadelphia, where he will devote himself to the engineering and financing of public service properties. Mr. Dodge was one of the founders and for many years one of the partners of Dodge & Day. He is the son of James M. Dodge, president of the Link Belt Company and other corporations. The office of the younger Mr. Dodge is in the suite with the banking firm of William A. Read & Company.

Platt Iron Works Company, Dayton, Ohio, announces the completion of its reorganization. The new company took over all the physical assets as well as the inventory and accounts receivable from the trustees on Sept. 30. It starts in business not only free of all floating indebtedness, but with a working capital of $700,000 as well. The new company is capitalized as follows: Preferred stock, $1,100,000; common stock, $1,000,000; 6 per cent twenty-year gold bonds, $700,000. The directors are: Waddill Catchings, chairman; George W. Davison, Albert Rathbone, E. F. Platt, J. B. Reichmann. The officers are as follows: J. B. Reichmann, president; E. F. Platt, vice-president and treasurer; J. F. Hartlieb, vice-president; John Sturgess, secretary. The entire organization, including the engineering force, has been kept intact. Improvements now being made to the property at a cost of $50,000 will greatly increase the capacity of the plant and materially facilitate the handling of orders.

ADVERTISING LITERATURE

Chicago Pneumatic Tool Company, Chicago, Ill., prints in Bulletin No. 121 a description of its pneumatic rammers and foundry equipment.

Vulcan Engineering Sales Company, Chicago, Ill., has issued a circular in which its smallest metal sawing machine, type 1-M, is described and illustrated.

J. W. Paxson Company, Philadelphia, Pa., has issued Bulletin No. 28, in which Paxson-Warren sand blast machinery is described. Bulletin No. 26 describes and illustrates the Paxson-Collian cupola.

Western Wheeled Scraper Company, Aurora, Ill., has issued a 128-page catalog which describes and illustrates its complete line of scrapers, plows, dump cars, elevating grades and wagons, and wood machinery.

H. A. Strauss Company, Chicago, Ill., has printed a twenty-four page booklet, which outlines the various undertakings of the company and illustrates a few typical installations showing the diversity of its work and the range of territory covered by its operations.

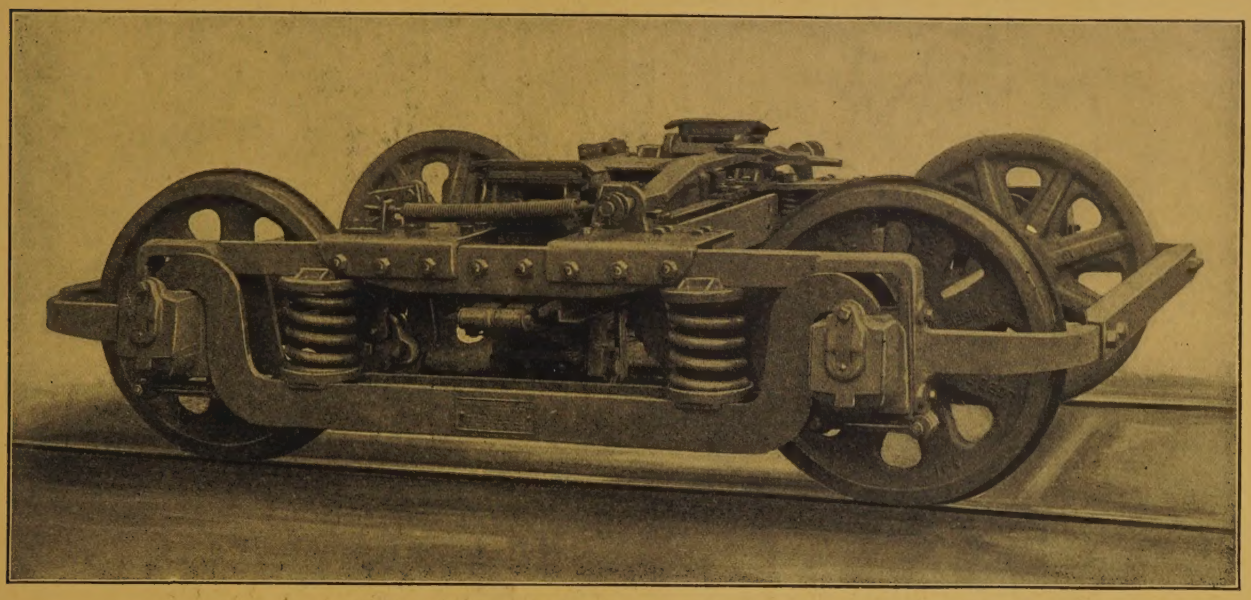
Standard Underground Cable Company, Pittsburgh, Pa., has issued a novel folder entitled "Samples from an Extensive Line." The covers are printed and cut so as to represent a trunk while the interior contains illustrations of the company's extensive line of cable terminals and junction boxes.

NEW PUBLICATION

Syllabus of Mathematics. Compiled by the committee on teaching of mathematics to students of engineering and published by the Society for the Promotion of Engineering Education. Ithaca, 1912. 136 pages. Price, 65 cents.

This work is intended to include those facts and methods of elementary mathematics which should be known to a student who has completed courses in the various subjects; that is to say, those fundamental principles which should have been made so completely a permanent part of the student's mental equipment that with them he will not need to begin the study of the subject from its elements. It is not intended as a program of study for beginners, but in reviewing any of the subjects the work should prove serviceable to both teacher and student; and in the hands of a skilful teacher, supplemented by a sufficient number of problems, it might easily be made the basis of a course of study conducted by the syllabus method. To many engineers who have only a somewhat vague recollection of the mathematics which they studied at college the book should prove of real value in refreshing the mind for the occasional problems which arise and the importance of which is by no means indicated by the fact that they arise only occasionally in actual practice. The different chapters cover algebra, elementary geometry, trigonometry, analytic geometry and differential and integral calculus, together with applications to algebra, geometry and mechanics. The feature of the book is the clarity and conciseness of its demonstrations.

BRILL CITY AND INTERURBAN CARS AND TRUCKS BRILL



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Safety, the first consideration in a high speed truck, is in this design provided by one-piece solid forged side frames. This insures not only ample strength where it will do the most good, but also makes possible a transom, pedestal tie bar and end frame construction of a character that insures permanent squareness.

A one-piece cast steel bolster is another feature of this truck. The number of parts has been cut to an irreducible minimum and brake parts are made highly accessible.

There are four sizes of the Brill No. 27 M. C. B. Truck—for journals $3\frac{3}{4}$ x 7, $4\frac{1}{4}$ x 8, 5 x 9 and $5\frac{1}{2}$ x 10.

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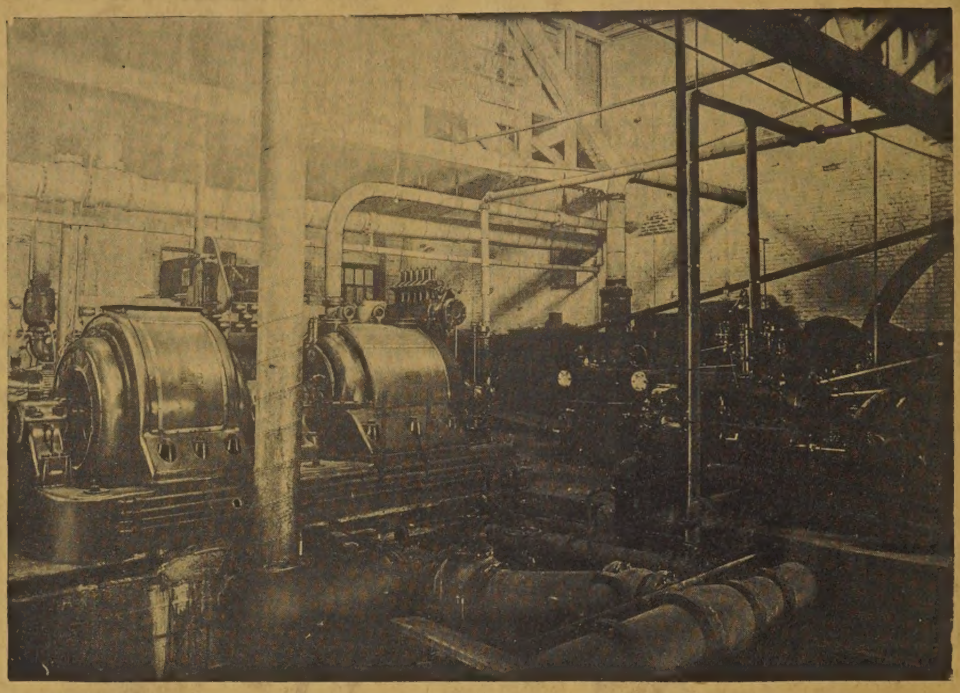

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The railway and lighting loads of Mason City are carried by this single unit, with only minor generating apparatus in reserve.

This is a typical instance of where central station service is almost entirely dependent upon the continuous operation of a single Curtis steam turbine.

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